Mining CONGRESS JOURNAL

THE AMERICAN MINING CONGRESS

JANUARY
1945

with anthracite's most Powerful Electric Hoist

. . . 93 trips per hour to surface 420 tons of coal—*that's real production!* And that's the everyday record for this Westinghouse powered and controlled mine hoist—the most powerful in the anthracite field.

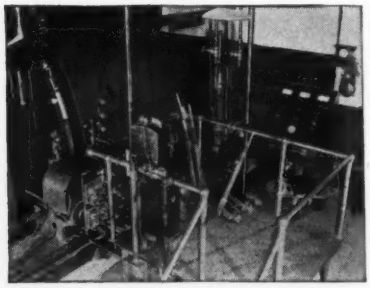
It takes a lot of horsepower to do a job like this—1750 in fact—supplied by this powerful pedestal-type, wound-rotor Westinghouse induction motor. Operating on 2200-volt, 3-phase, 25 cycle power, the motor drives a large gear unit, connected to a conical drum carrying the 1700 ft. of 1⅝" steel cable used to raise and lower the cages.

This hoist replaces an old 30 x 60 steam unit—and provides faster and more economical hoisting.

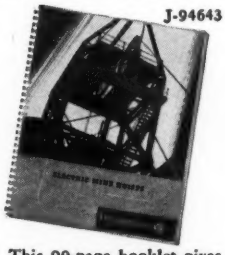
Conditions surrounding this installation were such that the purchase of low-cost, highly efficient alternating current equipment was recommended by Westinghouse engineers after a study of the requirements.

This is just another example of the ability of Westinghouse to solve the toughest mining problems. For a simple solution to your complex electrical problems, call your nearest Westinghouse Office. Westinghouse Electric & Mfg. Co., P.O. Box 868, Pittsburgh 30, Pa.

J-94643



CONTROL STATION—Primary hoist control is furnished by electro-pneumatically operated contactors. Secondary control gives 10-point acceleration through adjustable relays of the definite time-limit inductive type, operating on the last seven contactors. The first three points are under manual control. An electro-pneumatically operated air-brake contactor provides for reversal on the 2200-volt circuit.



This 90-page booklet gives complete information on how to select electric hoist equipment to meet your special requirements. Write for free copy of B-3055 today.

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

ELECTRICAL EQUIPMENT FOR THE MINING INDUSTRY

Mining CONGRESS JOURNAL

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FRONT COVER: Women workers at American Smelting & Refining Co. plant at Garfield, Utah, tapping dolly bar into reverberatory furnace.

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Skilled craftsmen make Joy mining equipment to the exacting specifications set up by our engineers. Ruggedness and economy are placed first.

The six ton capacity of the Joy model 60-D Shuttle car pictured below makes it one of the most economical units in mines whose height permits use.

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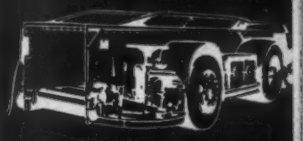
Call in a Joy Engineer

Inner strength-Ease of Operation

When being built, Joy Loaders present a clear picture of the strong, simple, efficient construction which makes them foremost in many mining fields.



This 11 BU. Joy Loader was built especially for loading hard rock and ores. It is a standard Joy model modified to meet our customer's specifications.

E YEARS OF ECONOMICAL, EFFICIENT OPERATION

Worn or Broken Surfaces can be BUILT UP *quickly* with "997" Low-Fuming Rod

Let's help the other fellow, too.

Under the stress of present industrial output, mechanical production equipment often feels the strain. Bronze Welding is being used extensively, not only for the repair of iron, steel and copper alloy parts, but also for the building-up of worn surfaces. If you've done an interesting bronze welding job that you feel would help the other fellow, tell us about it. If of general interest, we'll pass the word along in these pages.

With five teeth gone from this large gear and an important production unit stopped dead in its tracks, what's a Production Manager to do? A new gear meant patterns, castings, days of machining—weeks of delay. Pegging the broken teeth would cut down the delay—but increase the hazard of a repeated failure.

It's in a pinch like this that the importance of Bronze Repair Welding with the oxy-acetylene torch is most appreciated—for by using this fast, economical method of repair the gear was welded, machined and back in operation in a few days. Low temperature bronze welding with "997" Low-Fuming, Tobin Bronze* and other Anaconda Welding Rods is so controllable that it is often possible to weld parts without dismantling, and in many instances, finish by filing to a template.

"Don't Scrap It... Bronze Weld It!" is more than a slogan—it's a NECESSITY in many plants. Publication B-13 contains suggested welding procedures and examples of savings in repair time and expense. Write for a copy.

*Reg. U. S. Pat. Off.

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Postwar business competition is going to be tough. Whether your trucks *make or lose money* for you is going to be more important than ever before.

Today in wartime, the lack of new civilian trucks has thrown a revealing light on the performance and stamina of every make of truck in the United States. Right now is the time to dig into all the facts as they exist—to find out which trucks are standing up best under the toughest conditions trucks have ever had to face.

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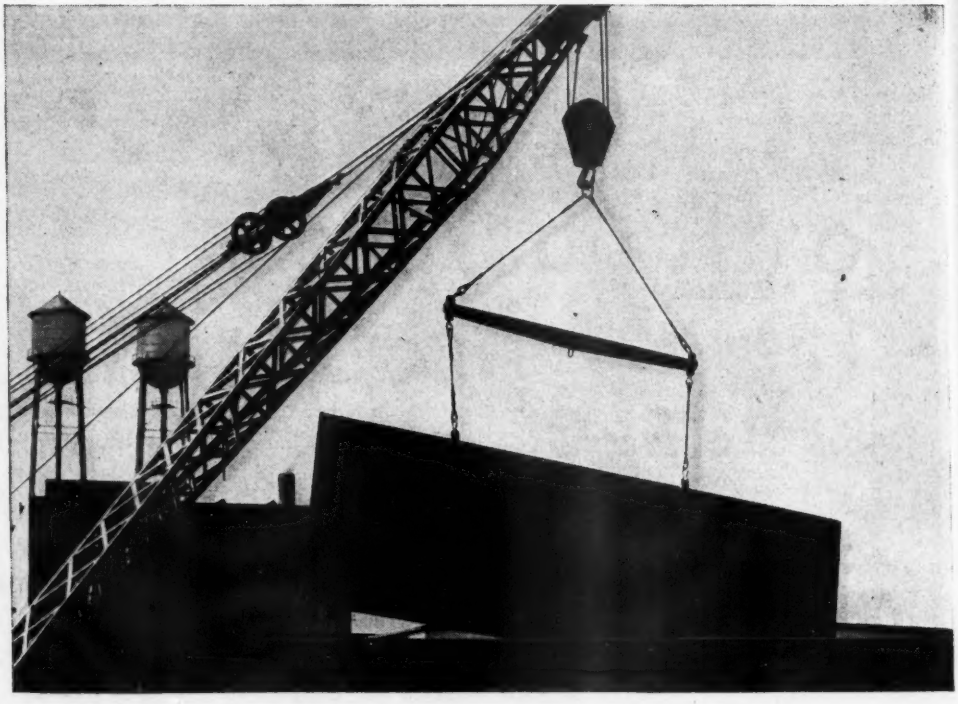

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Regardless of the job at hand or immediately ahead, you'll find that American Cable **TRU-LAY PREFORMED WIRE ROPE** handles easier, reeves faster, lasts longer, is safer for the workmen.

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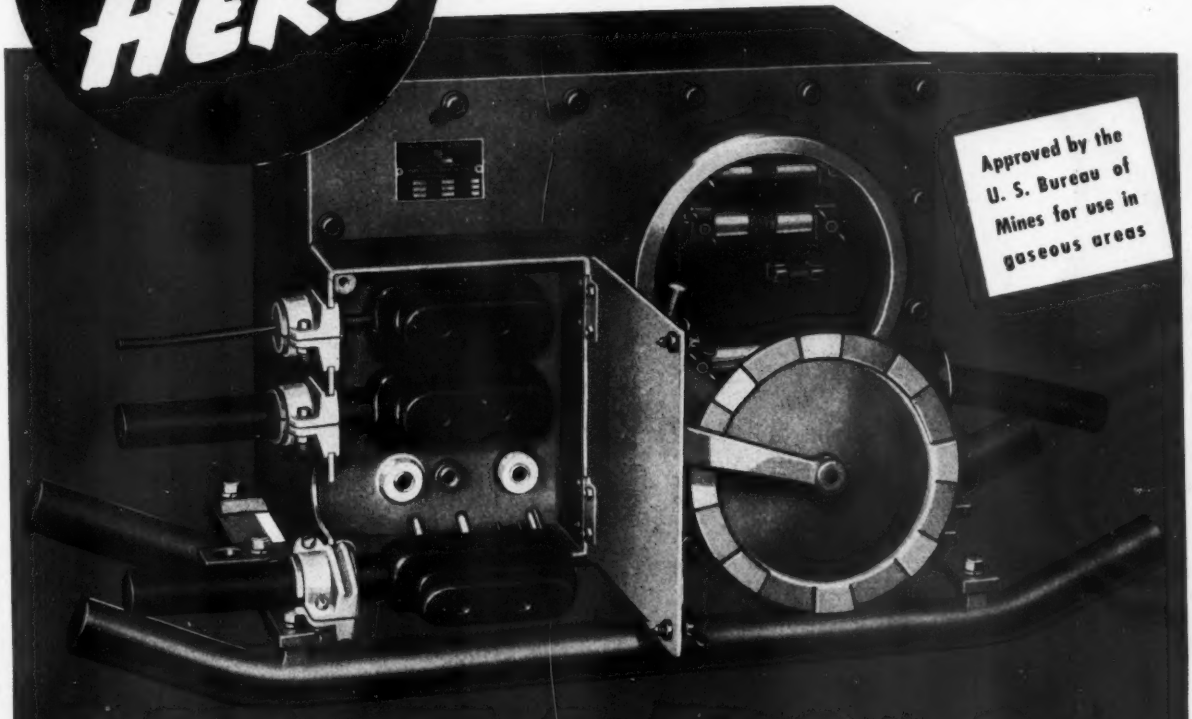
IT'S HERE

A Time-Saving, Production-Boosting Means of Connecting Multiple Face Circuits Underground



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Save Time

Connections made quickly. Light weight speeds movement as face advances.

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One-third as much multiple cable required to handle three face circuits. Machine cables fuse-protected against burnout.

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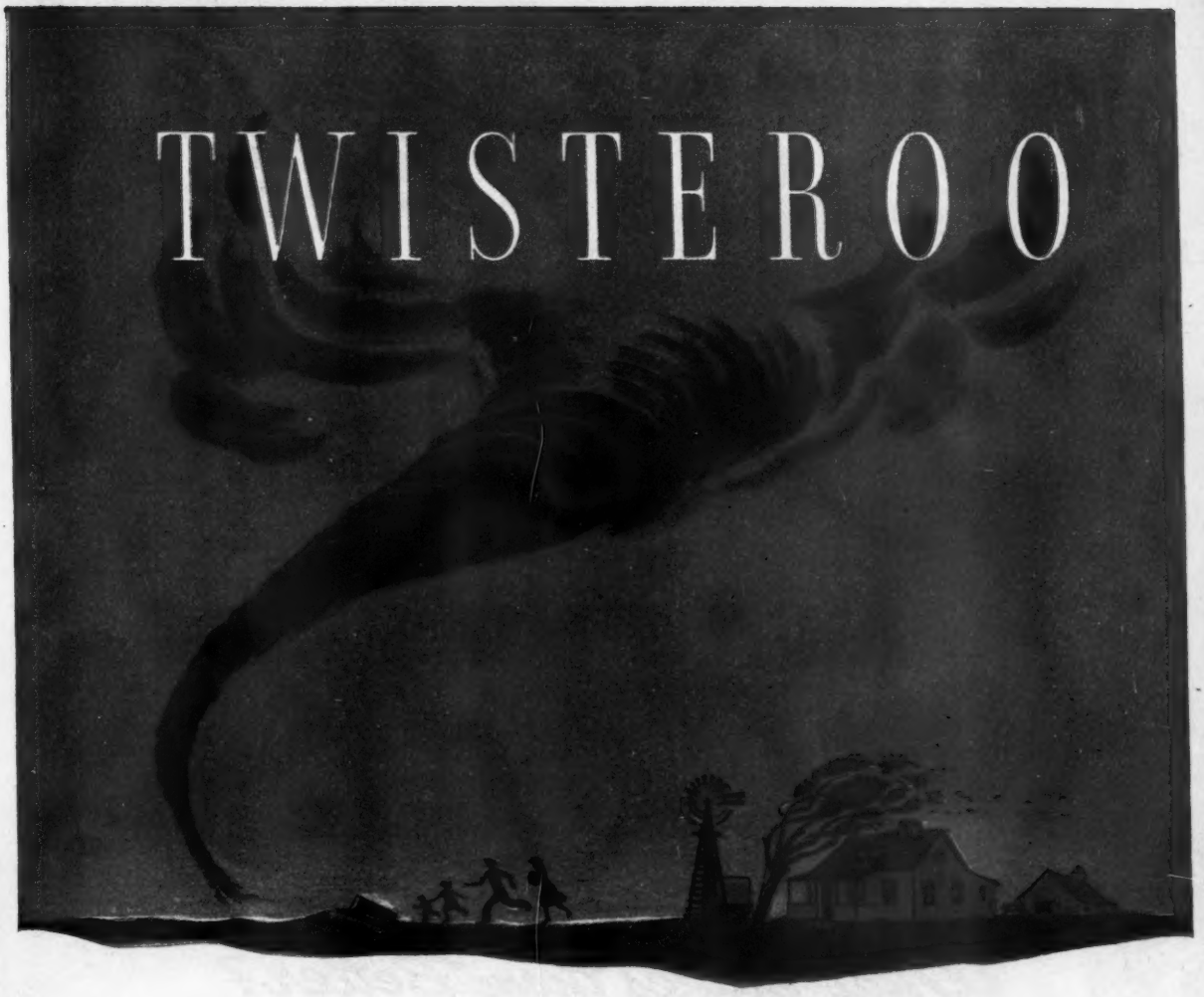
Exide
BATTERIES

If you wish more detailed information or have a special battery maintenance problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 1982.

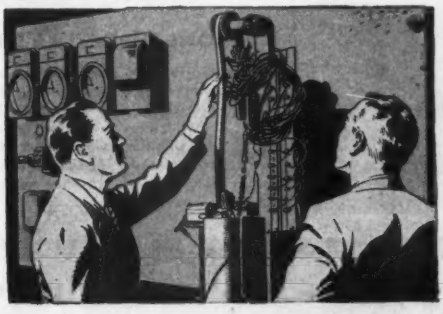
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto



THAT'S WHAT WE CALL the twisting test we give U.S. Royal Mining Machine and Locomotive Cables. They are clamped by steel jaws—bent and twisted twice every second—hour after hour absorbing far more punishment than they would ever get in years of hard service.

Moreover we test U. S. Royal Mining Machine and Locomotive Cables by impact, compression, heat, cold and stretch...so that when they leave our plant and go to you, we know that they are *super-dependable* for just about any kind of work.

That is why Mine Operators and Locomotive Designers can specify U. S. Royal Mining Machine and Locomotive Cables with *absolute* confidence whenever they want balanced construction, flexibility, dielectric strength, smoothness of finish, and long trouble-free service.



THE NEW U. S. ROYAL

Safety Tested

MINING MACHINE AND LOCOMOTIVE CABLES

SERVING THROUGH SCIENCE

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Haul Heavier Loads—

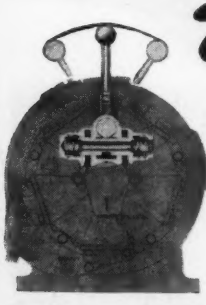
Faster with the **NEW**

GARDNER-DENVER AIRSLUSHER

STRENGTH AND POWER to haul bigger loads . . . faster, amazing simplicity of operation . . . that's what the *new* line of Gardner-Denver Airslushers gives you.

These new Airslushers—made in three sizes—enable you to get out more muck per shift. They're built to operate dependably, day in, day out, year after year . . . to stay underground . . . because all working parts are fully enclosed. Dirt and water are sealed out—lubricant is sealed in.

What makes them Better?

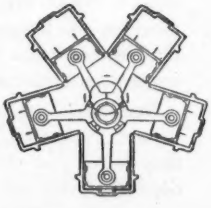


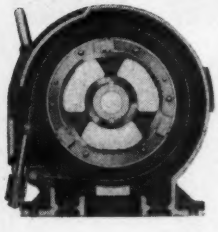
ONE THROTTLE LEVER ONLY

Gardner-Denver Airslushers are operated entirely by a single throttle lever. Operation is so easy that the operator can move the lever with two fingers. Contrast this with the multiple controls required in other designs! The single Airslusher throttle returns to neutral when released.

HIGH TORQUE AIR MOTOR

Powerful, five-cylinder radial air motor provides high torque at all speeds . . . develops maximum power and speed in either direction. This high torque assures greater crowding action for bigger loads, and the motor flexibility makes possible a faster return of the empty scraper. Motor operates only when Airslusher is working . . . saving air and prolonging motor life.





SIMPLE ROLLER CLUTCH

With this clutch—essentially a free-wheeling device—power is applied at will to either drum by simply reversing the air throttle. The clutch automatically engages one drum and releases the other when the throttle is reversed. Power is delivered from the air motor to the loaded drum with a minimum of friction loss. Clutch never needs adjustment—is virtually indestructible.

COMPACT . . . Fits Narrow Stopes or Drifts

The new Gardner-Denver Airslusher is compactly built and light in weight for convenience in moving through small raises and chutes into inaccessible stopes. Throttle lever can be lowered to horizontal position for maximum compactness and to avoid accidental damage while moving.

For complete information on the Airslusher that handles heavier loads, write Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER *Since 1859*

We Switched Out The Trouble of Gear Shifting

Here is simplicity itself . . . absolute freedom from the mechanical complications of transferring power from one shovel motion to another.

Powered by its own heavy duty, shovel-type motor, the P&H propel machinery is completely independent of all hoisting and swinging motions. P&H's independent propel drive means simpler, easier move-ups . . . it means less trouble, less time out.

The change from dig to propel is instantaneous on a P&H Electric Shovel — accomplished by a mere flick of the master propel switch. Sliding gears and mechanical clutches with their complicated mechanisms are entirely eliminated — there is far more time for actual digging.

Here is another important advantage in the interests of lower tonnage costs for all kinds of open-pit operations. Behind it is P&H's 60-year leadership in applying electrical power to the movement of heavy loads.

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Models NH-600 and NHS-600

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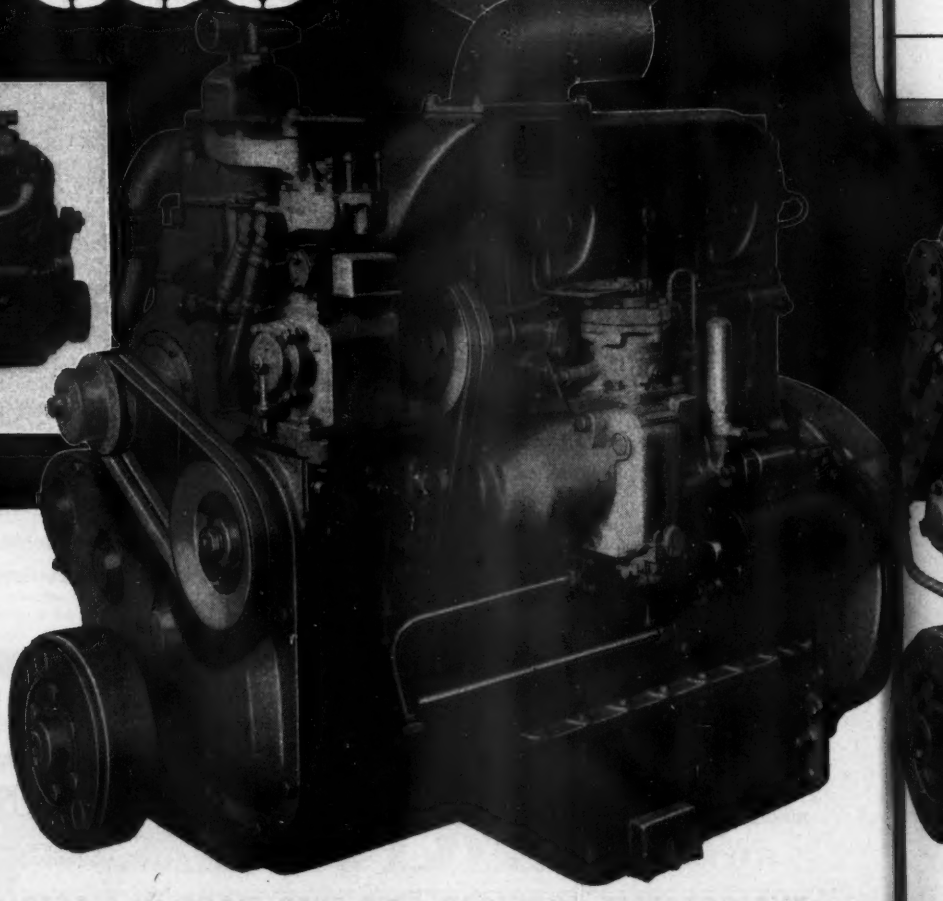


200 hp.

Model NH-600, 200 hp. at 2100 rpm. (maximum). Designed for heavy-duty automotive, industrial and marine service. For specifications, see table on opposite page.

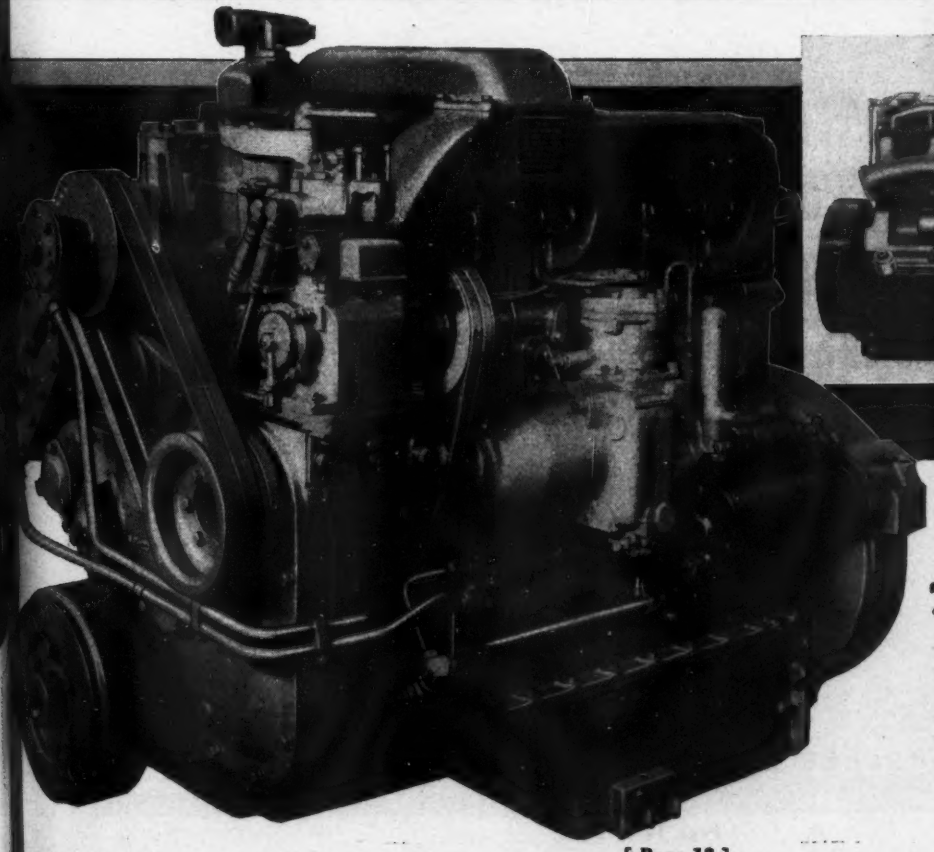
mbining "something old and something new," Cummins—builder of the *ginal* high speed diesel—now introduces two additions to the line of Cummins pendable Diesels: Models NH-600 and NHS-600.

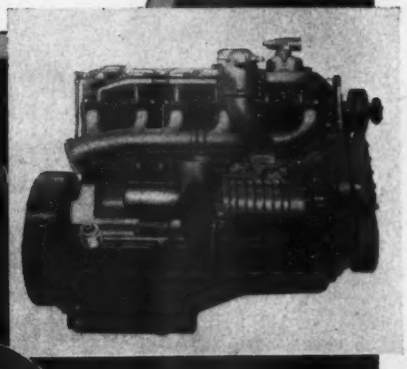
The "something old" is the basic design of the well-known Model H Cummins esel . . . a design proved sound by a 12-year demonstration of low-cost, depend- e performance in all types of heavy-duty applications.

The "something new" in NH and NHS Cummins Diesels includes dual intake l exhaust valves, higher rpm., larger piston displacement and many other nements that will give you "more power per pound" and the Nth degree power efficiency . . . that will assure increased payloads and higher profits on r *tough* jobs—automotive, industrial or marine. A comprehensive brochure taining complete specifications and engineering data on Series NH and NHS mmins Dependable Diesels is now available. Write for your copy of Bulletin 6-23 today. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.

del	No. of Cyl.	Bore and Stroke	Displacement (cu. in.)	HP. (Maximum)	RPM. (Maximum)	*Weight	Weight per Horsepower	*Dimensions
	6	4⅞" x 6"	672	150	1800	2165	14.43	57⅝" x 46 ⅛" x 30¼"
6	6	4⅞" x 6"	672	200	1800	2580	12.9	58½" x 46 ⅜" x 29⅞"
H	6	5¼" x 6"	743	200	2100	2500	12.5	58½" x 49 3/16" x 28⅞"
HS	6	5¼" x 6"	743	275	2100	2850	10.36	60½" x 48 13/16" x 32⅜"

*Weights and dimensions are for engine as designed for automotive application (as illustrated) and will vary with units designed for industrial and marine service. Weights are based on minimum use of light weight materials.





275 hp.

Supercharged Model NHS-600, 275 hp. at 2100 rpm. (maximum). Designed for heavy-duty automotive, industrial and marine service. For specifications, see table above.

KAISER COMPANY, INC.
IRON AND STEEL DIVISION
LATHAM SQUARE BUILDING
OAKLAND, CALIFORNIA

November 10, 1944

Mr. W. H. Richardson
General Manager, Western Division
The Timken Roller Bearing Company
1800 Van Ness Avenue,
San Francisco, California

Gentlemen:

With the successful completion of Shasta Dam and the cessation of The Columbia Construction Company's 9⅛ mile conveyor belt we feel your company to be deserving of a note of appreciation.

This belt, equipped with anti-friction troughing rolls that utilized some 70,000 Timken tapered roller bearings economically hauled the amazing total of almost 13 million tons of sand and gravel! -- and with an absolute minimum of repair and maintenance cost.

We can conservatively state that the entire conveyor system performed most satisfactorily in every respect. Congratulations!

Yours truly,

THE COLUMBIA CONSTRUCTION COMPANY, INC.

Henry J. Kaiser
President

HJK:vmcd

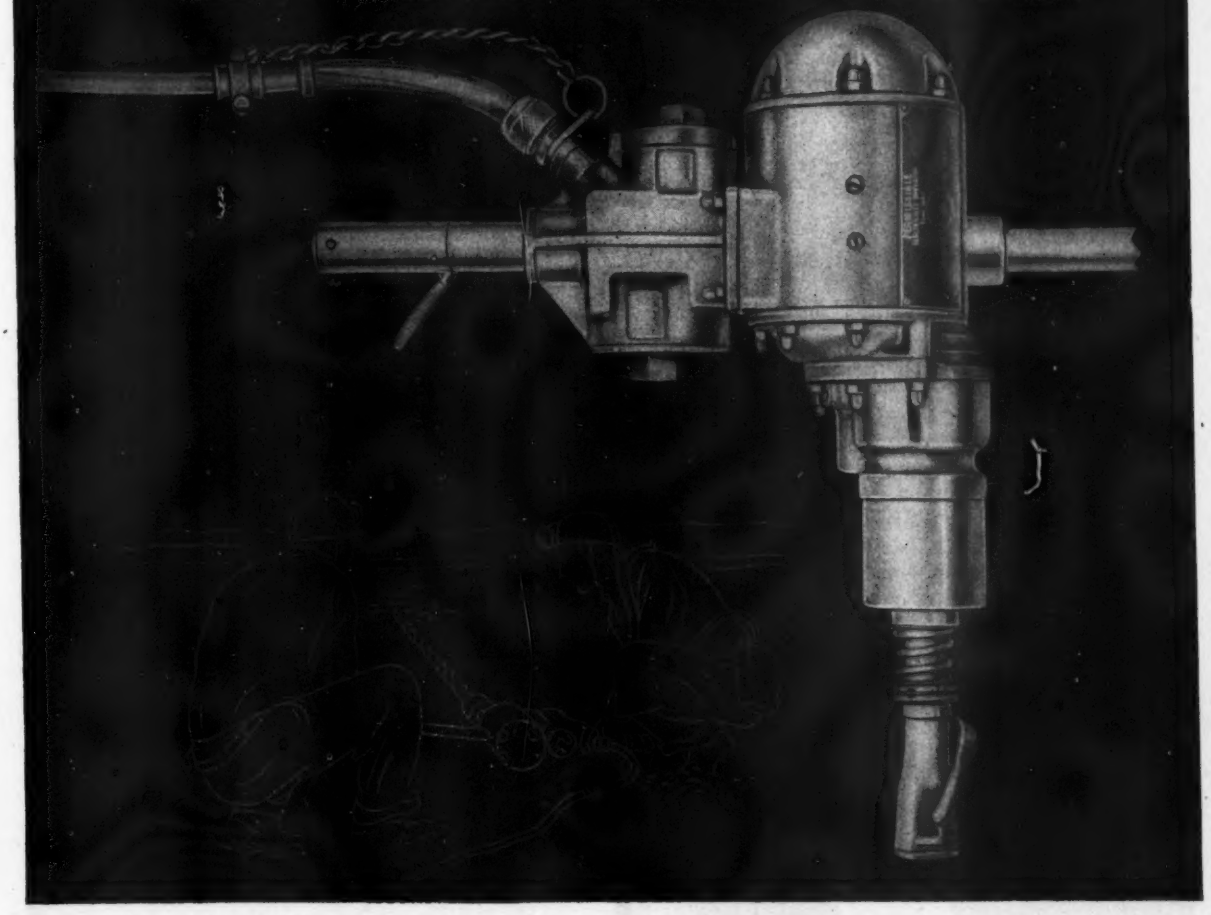
THE COLUMBIA CONSTRUCTION COMPANY REPORTS ON TIMKEN BEARINGS AT SHASTA DAM

Timken Bearing Equipped Conveyors manufactured by Chain Belt Company, Milwaukee, Wis.

TIMKEN
TAPERED ROLLER BEARINGS

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

112 holes in 14 hours



CP No. 572 Permissible Hand-Held Coal Drills

CP No. 572 Permissible Electric Coal Drills with Safety Clutch, in the difficult drilling Alma seam, are performing regularly at the rate of 112 holes, 2¼" diameter by 7 feet deep, for each day of two seven-hour shifts. Drilling time ranges from 1 minute, 10 seconds, to a maximum of 1 minute, 30 seconds, per hole.

CP design features include unusual accessibility for examination of parts, light weight, and a safety clutch for release in case an auger sticks — a valuable protective feature for the operators and motor. Write for Catalog 902.

CP offers the largest line of Hand-Held and Post-Mounted electric coal drills: five sizes of the Hand-Held type; and four sizes of the Post-Mounted type.

★★★★★★★★★
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ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

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VACUUM PUMPS
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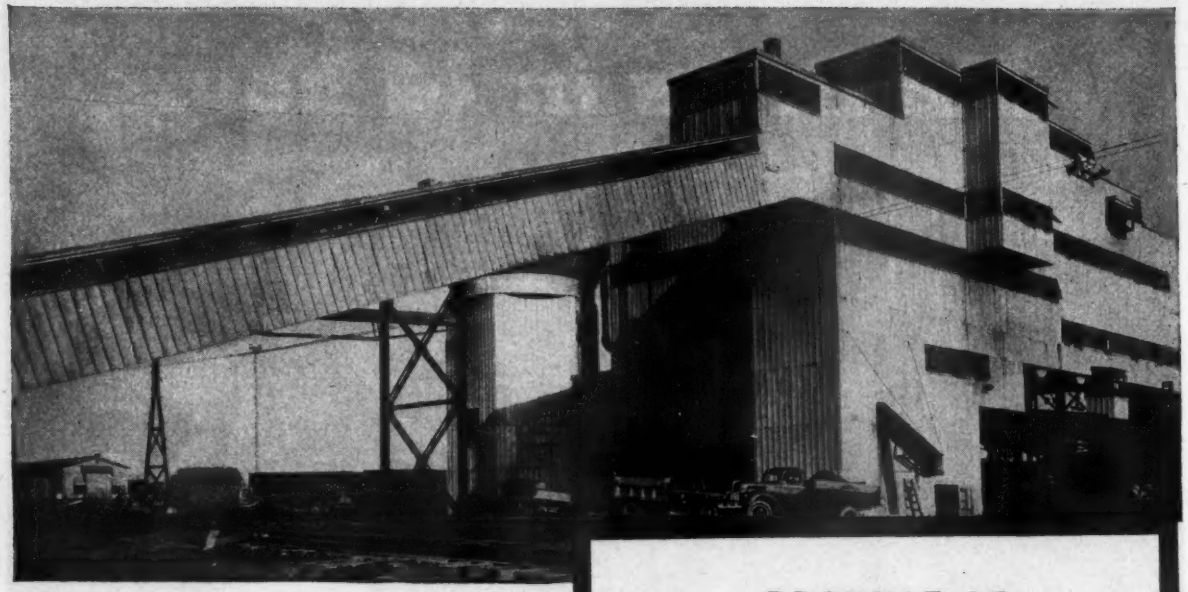

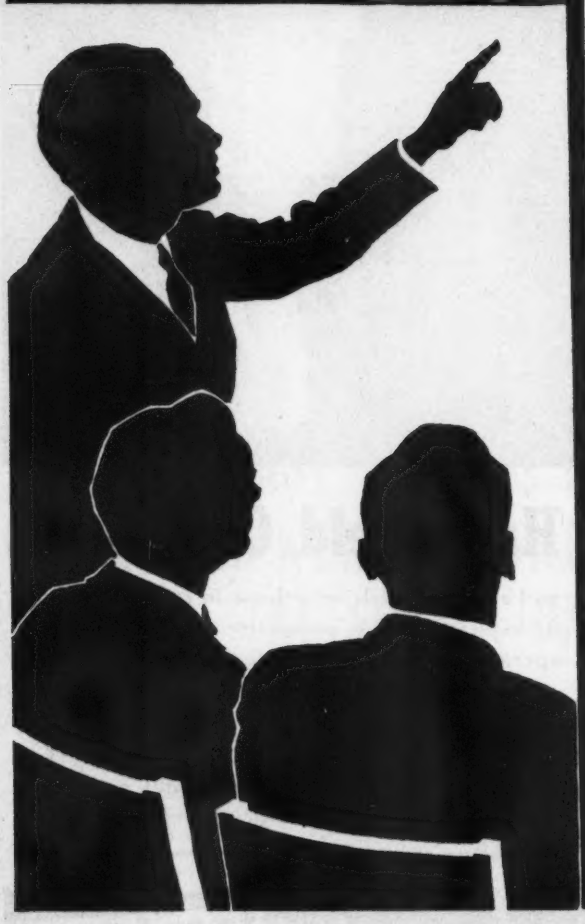

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Mining
CONGRESS JOURNAL

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S. A. TRENGOVE, Editor

Volume 31 JANUARY, 1945 Number 1

Machinery for Britain

BRITIAN'S six-man mission to study American coal mining methods recently reported, ". . .we are of the opinion a majority of machines received from America are . . . inferior to those seen on sites in the United States." Early British editorial comment drew the inference that "if open coal workings in Britain are inefficient, the Americans are to some extent responsible."

Such statements are easily misinterpreted and with eminent fairness the London *News Chronicle* pointed out that the report by an American coal mining commission on British coal mines was suppressed by the government. It asks, "if there are recriminations, should we not hear both sides?" Such comments by British writers tend to dispel the erroneous impression that was created, but some may still retain the impression that we are letting our Allies down. We should therefore fortify international unity with full information on the subject.

On our side of the water, unprecedented production demands have pressed every available machine into service—and every item has been made to perform to its utmost ability. Some of the machinery we have sent to Britain is not of the latest design and vintage only because in our rush to give the quickest possible boost to her coal production we had to ship whatever was available. Actually, equipment has been sent abroad with some feeling that its retention here would mean greater production in our own more efficient mines. The transfers, however, have been made in order to provide more shipping space for troops and supplies if the coal can be mined abroad.

Hampered by inefficient methods, old and outmoded equipment (in poor repair) and a multiplicity of labor difficulties, the British but recently have fully realized the large differences between mining methods in the two countries. Some applications of American machines and methods have already improved the situation but it's going to take quite a while to catch up. We hope, as fellow mine operators and allies, that they will rapidly succeed in coming abreast of our production results. America has given of her resources in many ways to bring this about—in introducing machines, in instructing and advising as to operation and maintenance.

Any trans-Atlantic bickering over the subject is ill-advised as the handling of mine machinery allocation to date has been a truly remarkable example of breadth of vision and keen sense of overall fairness on the part of those to whom the task has been assigned.

Exit Complacency

IF CONGRESS complies with the administration's request for work-or-fight legislation, something on the order of the May-Bailey bill now in the hands of the House Military Affairs Committee may be enacted. The current rush toward a labor draft presents a sharp contrast to the rosy picture of pre-election weeks—and up until the time of the Von Runstedt surprise on the western front.

The general complacency existing prior to the Belgian bulge was evidenced by much "job-jumping" and a wide-spread tendency to get into peacetime jobs. An important percentage of labor, lulled into the belief that there was little left to do but pick up the pieces in Europe, acquired a "reconversion" complex and acted accordingly. Many of these people, finding themselves in the dog-house (through no fault of their own) are going back to essential jobs with perfect willingness now that the true picture has been presented to them.

Byrnes' "work or fight" edict may have had something to do with resuming war jobs but our guess is that job skipping would have been far less if so much hadn't been said to indicate the war was already "in the bag" before the Nazis handed us that pride-denting wallop in December. Withal we shall have come to stiff measures if the labor draft goes through as the war services demand.

Committee members are not enthusiastic about the bill and it has been strongly denounced by representatives of labor and management. The Army and Navy are charged with taking this psychological moment to employ "pressure methods" to get control of civilian as well as military manpower. It is claimed that figures presented by war service agencies, showing labor requirements of 700,000 between now and June 30 are erroneous, representing more than double actual needs. Needed labor, it is asserted, can be supplied from a potential pool of some 1,400,000 without legislation. Perhaps, while this storm is at its height, and those in high places argue about how to do it, the breach will have been effectively closed through voluntary action.

Industry does not condone slackers but neither does it want military control of labor. What we *all* want is a deeper understanding and appreciation of the problems at hand. Let us not again allow the cloak of complacency to fall upon the shoulders of either labor or industry; let us first be certain that the military objectives are secure, lest we set the stage for a type of penal control and regimentation which will be forever distasteful to Americans.

Strip Coal In Western Missouri

Capacity of 1,350,000 Cubic Yards of Overburden Removal per Month Makes Available 1,000,000 Tons of Washed Coal per Year

By MYRON READ
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IN WESTERN MISSOURI, 60 miles south of Kansas City and a few miles east of the Missouri-Kansas line, the Sinclair Coal Company of Kansas City, Mo., through its affiliate, the Hume-Sinclair Coal Mining Company, operates a coal strip mine and washing plant that is currently producing one million tons of washed coal a year. The Sinclair Coal Company is affiliated with coal strip mining companies in Missouri, Kansas, Oklahoma, Illinois, Kentucky, and Alabama, and is the largest producer of coal in Missouri, through its two affiliates, Hume-Sinclair and Huntsville-Sinclair Coal Mining Companies.

The units of the Hume-Sinclair operation consist of two strip pits on adjoining land two miles southeast of Foster, Mo., a tipple at Foster, and a washing plant at Tiger, Mo., which is five miles west of Foster. The washing plant is on the main line of the Kansas City Southern Railroad and a branch line of the Missouri Pacific Railroad. This branch runs east to the tipple and then on to the main line which is seven miles further east. A machine shop, stock room, and offices are maintained at Tiger, and a garage at Foster.

Marion shovel with 7½-yd. bucket bites into the coal and loads it into 70-yd. trailers

General Mining Picture—Featured by 70-Ton Haul Units

The mining is done in the usual manner of the Middle Western coal stripping fields, the coal being uncovered and mined in strips. The pit width is usually 75 ft. and the length varies from a few hundred to several thousand feet. Overburden is handled only by the stripping shovel, being deposited where the coal has already been removed by the previous cycle of operations. Stripping is kept about half the pit-length ahead of the coal-loading shovel. Large electric shovels are used for stripping, smaller ones for loading the coal into the tractor semi-trailer haulage units. These haulage units carry the coal to the tipple at Foster where it is loaded into railroad cars and transported to the washing plant at Tiger where the coal is washed, screened, and loaded into railroad cars for shipment to the consumer. The most unusual feature of the operation is the extremely large haulage units that are used. The Sinclair Coal Company has pioneered in the development of tractor-trailer units for use in coal stripping, starting with a six-ton semi-trailer in 1932, and progressing to the present fleet of six 70-ton units. It is believed that these are the largest haulage units in operation in this country today. Each is powered by a tractor with a six-cylinder 250-horsepower Waukesha internal combustion butane-fueled engine.

Hume-Sinclair is mining the Mulberry bed, the highest workable bed of coal in Bates County. This lies at the base of the Pleasanton shale of Pennsylvanian age. It averages 34 in. in thickness and is overlain by 20 to 50 ft. of shale which in places contains massive sandstone lenses. The coal is of good quality, stocks well, and contains only a small amount of sulphur. Directly under the coal lies several ft. of clay and below that is a thick limestone which is the top member of the Henrietta formation. The Lexington coal horizon is 100 ft. below the Mulberry coal. This has been mined in some places in the county where erosion has reduced the cover to workable proportions. At a vertical distance of 240 to 270 ft. below the Mulberry coal is the Rich Hill coal bed. In the past, this was extensively mined in the eastern parts of

the county, where the higher beds have been eroded off. Broadly speaking, the stratigraphic sequence is nearly horizontal, although local dips are not uncommon. As exposed in the pits at Foster, the coal is essentially flat but because of local variations in the altitude of the beds, the pit floor often has fairly steep grades.

Varied Problems of Drilling and Blasting

The coal lands are prospected by Hume-Sinclair using a portable, gasoline-powered churn drill. Three-in. holes are drilled on 300-ft. centers. Where the coal is unusually variable this spacing is reduced. This work is done by company employes. The

A Dart tractor hauls the coal trailers. A Waukesha 6-cylinder 250-hp. engine, burning butane fuel, is the power unit

right to mine the coal is obtained in most cases by leasing the land. A set fee per acre is paid to hold the land, and when mining is undertaken, the land owner is paid a royalty on the coal produced.

The overburden is drilled and blasted before being stripped. Horizontal drill holes five in. in diameter and of the same length as the cut being taken (usually 60 ft.) are put in by a rotary electric auger drill. The holes are placed about four ft. above the coal and on ten-ft. centers. The electric drill was made in the company machine shop and operates on 440 volts alternating current. It consists of a drilling motor traveling on a carriage of I beams and propelled by a wire rope running through a sheave and back to a small hoist. When the drill is operating, it is placed on four jacks, but when being moved, the mechanism is lowered onto two wheels. A team of horses is used to move the drill from one hole to the next.

The drill holes are loaded with cartridges of "Blaxstrip," which is made by the Equitable Powder Mfg. Co. The cartridges are 4½ in. in diameter by 24 in. long. Three sticks of dynamite, 3¼ by 8 in. in size, surrounded by black powder compose these cartridges. A primer of 3¼ by 8 in. 30 percent dynamite cartridges tied together is made up with a No. 6 electric blasting cap inserted in one of them. Tamping is composed of 8 to 10 paper bags, 24 in. long, filled with cuttings from the hole. The loaded holes are connected and then detonated with a magneto blasting machine.

When the sandstone lenses are encountered, vertical holes instead of the horizontal ones are drilled from the top of the overburden. The same type of drill is used, but the holes are loaded with 4 by 16-in. cartridges of 40 percent gelatin dynamite.

Horizontal Holes are More Economical Where Usable

The overburden is only shaken up by this blasting, no attempt being made to shatter and move it since this is not necessary for efficient digging by the stripping shovels. The use of horizontal drill holes greatly reduces the drill hole footage and explosives required. For example, a 50-ft. length of cut with 40 ft. of overburden takes five horizontal holes 60 ft. long, or 300 ft. of drilling. If vertical holes are drilled on 10-ft. centers along the cut and 20-ft. centers in the other direction, 15 holes 40 ft. long are required. This is 600 ft. of drill hole. Thus, less drilling footage and less explosives are needed to accomplish the same work and for this reason, when sandstone is not encountered, horizontal holes are used.

Equipment Specifications—Electric Bulldozer is Used

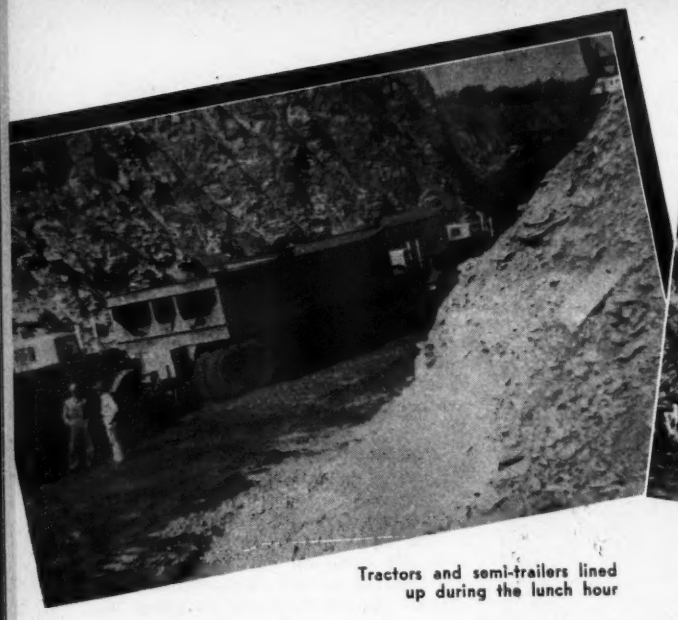
The two-strip pits differ primarily in the size of the equipment used. One pit uses all large equipment, whereas the second uses smaller machines. In the first pit, stripping is done with a Marion 5560 electric shovel with a 32-cu. yd. bucket. The boom is 105 ft. long and the dipper stick 65 ft. It is powered by three phase, alternating current at 4,400 volts, which is brought in on a single trailing three-wire rubber-covered cable. This current powers a motor-generator set that produces 230 volts direct current. All the motors that operate the shovel use direct current. This shovel can strip a bank 60 ft. high and 90 ft. wide in one operation. It is now being used to strip from 20 to 50 ft. of overburden, carrying a pit width of 75 ft. The shovel travels on eight caterpillar treads, two at each corner. It has automatic hydraulic leveling cylinders at each corner.

A caterpillar tractor fitted with a bulldozer blade follows the stripping shovel and is used to clean off minor rock materials from the top of the coal. It has been converted to electric operation at 440 volts AC. The bulldozer pushes any missed dirt up to the base of the bank on which the shovel is digging. No other top cleaning of the coal is necessary.

Coal Loading by 7½-Yd. Electric Shovel into 70-Yd. Semi-trailers

The coal is loaded into the trucks in this pit by a Marion 4160 shovel-type loader, electrically operated and with a 7½-cu. yd. bucket built in a rectangular shape for greater efficiency in digging the 34-in. bed of coal. No preliminary blasting of the coal is necessary for this loader. The electricity comes into this machine as 4,400 volts AC and goes to a motor-generator set that produces 230 volts DC.

This 7½-yd. electric shovel loads the fleet of six large tractor semi-trailer units. These carry the coal to the tipple at Foster, a four-mile round trip. The first one of these



Tractors and semi-trailers lined up during the lunch hour

The Marion electric stripping shovel is equipped with 32-yd. bucket

immense units with a capacity of 80 tons was built in 1939. The semi-trailer is 32 ft. long, 12 ft. wide, and 11 ft., 2 in. from the ground to the top edge of the body. After observing the performance of this unit, it was decided to make the succeeding trailers 8 in. less in height, or 10 ft., 6 in. from the ground to the top edge of the body. These carry a 70-ton load and five of this type were built. The trailer is made of Bethlehem Mayari-R steel, all welded construction, the front and rear being 3/8-in. plate, side hoppers 5/16-in. plate, and the side body 3/16-in. plate. At the rear of the trailer are eight wheels. There are two rear axles, each independently sprung, and having dual tires at either side. The tires are 14.00 x 24 size. Each of the four sets has brakes actuated by compressed air. The trailer has two dump doors lying horizontally in the trailer bed. They are unlatched by an electrical control and drop to a vertical position when dumping. A bumping block over which the trailer passes after dumping closes the doors. There are four leaf springs of the standard type, two for each axle.

Tractor Units Are Described

The tractor unit is powered by a 250-horsepower Waukesha internal combustion engine which has six cylinders with 6¼-in. bore by 6½-in. stroke and a 5.20-to-1 compression ratio. Butane, the fuel used, is carried on the trucks in tanks as a liquid under pressure. From the tanks it passes to a heater where it vaporizes, then to a mixing chamber where air is added and the mixture finally led into the cylinders where it is ignited by spark plugs. The tractor has double tandem rear wheels, all eight being driving wheels, with 14.00 x 24 tires. On the front are two wheels with 12.00 x 24 tires. The tractor has four speeds forward and one reverse. Loaded, the tractor-trailer unit can travel 38 miles per hour on level ground. At the present time an average of one and one-half miles is obtained per gallon of fuel. The company estimates that the present four-mile round trip using these large units is less than the maximum economical haul in comparison with rail haulage. Thus, in normal times, the present five-mile rail haul from the tipple at Foster to the washing plant at Tiger might also be performed by these tractor-trailer units with subsequent reduction in coal handling costs. The prevalent tire shortage has caused the company to do all it can to reduce the wear on the tires, and thus the haulage on rubber is restricted. The Dart Truck Company of Kansas City, makes the tractor semi-trailer units.

Trucks Have Many Advantages

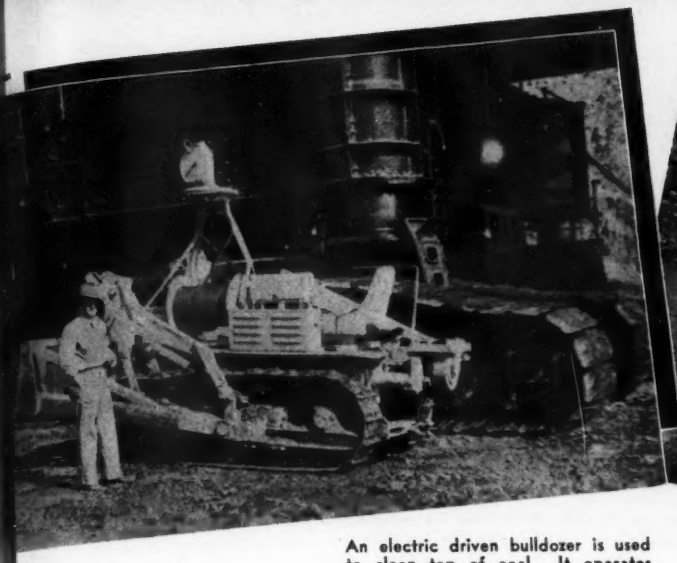
Truck haulage was adopted by Hume-Sinclair mainly to eliminate the track laying and shifting which is necessary with rail haulage. The importance of this increases with decreasing thickness of the coal since the thinner the coal, the more territory covered by the loading shovel in getting a day's tonnage, with a corresponding increase in track laying and shifting. Another advantage obtained is greater flexibility in the transportation units resulting in more continuous service to the loading shovel and greater ability to reach isolated territories, along with faster loading due to easier spotting of the automotive unit. It was found that increasing the size of the haulage units did not produce a corresponding increase in fuel consumption, the present rate of 1½ miles per gallon being about the same obtained with the 15-ton units previously used. Since grades are slight, excessive motive power is not required on the large units and they also achieve about the same speeds. As the trucks are used only to haul coal, abrasive wear is slight and loading impact on the bodies is not excessive. Large units give a better use factor and their maintainance costs are no higher. For these reasons, Hume-Sinclair has found that the use of 70-ton tractor semi-trailer units gives lower haulage costs than either smaller units or rail haulage.

Road Construction and Maintenance

The Sinclair Company builds and maintains its own roads from the pits to the tipple. First, the route selected is graded by a dragline and road graders. Then 18 to 24 in. of the "blue slate" from the pit overburden is spread over the graded roadbed and compacted. Crushed limestone obtained from nearby deposits is then brought in and spread three in. thick on the road. The tractor-trailer units run on this until it is well compacted. It is then oiled, and the result is a fine smooth road. Any heavy snowfall is removed from the roads by the grader, and ice is removed by spreading calcium chloride. A flagman is kept on duty where the company roads cross a county highway.

A Smaller Equipment Set-Up

At the second pit smaller equipment is used. The stripping is done by a Marion 5321 electric shovel with a 12½-yd. bucket. The boom is 95 ft. long, and the dipper stick 63 ft. The top of the coal is cleaned with a bulldozer, which in this case, is gasoline powered. The coal is loaded with



An electric driven bulldozer is used to clean top of coal. It operates on 440-volt a.c.

Portable electric pump units are employed to handle the drainage problem

a Marion 480 electric shovel equipped with a four-yd. bucket. The coal has to be blasted before this shovel can load it efficiently. This is done by drilling two-in.-diameter holes eight ft. apart with a small pneumatic jack-hammer and loading them with pellet powder in 1½ by 8-in. sticks, one stick to a hole. The powder is fired by an electric squib. Compressed air is obtained from a small portable gasoline-powered, compressor.

Only the smaller tractor-trailer units are used here. Five of these are in operation, the tonnages being 40, 30, 25, 20 and 16, one of each size. These are similar in construction and operation to the larger units.

The Tipple is at Foster—It Has Facilities for Screening

The trucks carry the mine run coal to the tipple at Foster where it is dumped into 150-ton hopper. From this the coal feeds onto a drag conveyor 5 ft. wide and 12 in. deep carrying the coal to an elevation many ft. above the railroad tracks. At present the coal is delivered from the conveyor at two points, as two tracks are being used for loading. The coal falls down chutes and into the cars. Men on the track level control the loading and spot the cars. The cars roll on a 1½ percent grade and are controlled by a frictional car retarder.

The tipple is equipped to be used as a screening plant for the raw coal, in which case the drag conveyor delivers the coal to the screen for separation into three sizes. Between the conveyor end and screen, is a hammer mill which can be used if only fine coal is desired. When there has been an unusual demand, coal has been screened for the market at this tipple and sold as a sized but unwashed product. Crushing the coal is rarely done.

From the Foster tipple, the raw coal makes the five-mile trip to the washer at Tiger in standard coal cars over tracks of the Missouri Pacific Railroad. Steam locomotives are used and the railroad company does all the handling.

Modern Plant at Tiger

At Tiger, the cars are pushed up a slightly graded track and left for the washing plant employes to unload by letting the cars roll down to the dump and stopping them by the car brakes. The bottom dump doors are opened by hand and the coal dumped into a hopper. From this it is fed into the washer on an elevating pan conveyor from where it is passed over sizing screens and two sizes are obtained; namely, 7½ by 3 in., and 3 by 0 in. Each product goes into a separate McNally-Pittsburgh Norton washer where the waste rock is removed. This washer is a jig in which the pulsations of water are produced with compressed air using an air valve to control the admission and exhaustion of the air to the bottom of the jig bed. Compressed air is obtained from a centrifugal blower. About 20 percent of the feed to the washers passes off as waste. The two streams of washed coal are joined and sent over a screen from which four washed sized products can be obtained. These are, mill, 1¼ by zero in.; stoker, 1/8 by 1 in.; nut, 3 by 1¼ in., and lump, 7½ by 3 in. The stoker size is not continuously made, but is only run when there are orders for it. This coal is sold under the trade name of "Tiger" coal. From the screens the coal flows out on conveyors to the chutes to the railroad cars. Men at the loading level control these chutes and run the cars under them by gravity using car retarders. When loaded, the cars are run down to the weighing scales. Here the weight is taken automatically and printed on a tape. The cars then run on to a spur to wait for the railroad to take them on their way.

The washer is electrically operated throughout. All controls are centered in two panels with an operator for each panel. Only two other men, an oiler and a sweeper, are needed to operate the washing plant itself. The plant is very clean and all stairways and ramps are protected by metal railings painted brilliant red.

The wash water for the coal is pumped into a settling cone. Here the coal slurry settles and the clean water is re-used.

Problems of Marketing and Management

Sales are handled by the Kansas City office of the company and all coal from the plant is loaded in railroad cars. The Kansas City Power and Light Company and two railroads, the Missouri Pacific and the Kansas City Southern, are the largest consumers of Tiger coal. As these companies not only buy coal the year around, but also stockpile it during the summer, the Hume-Sinclair Company has a remarkably stable market. During the past years, it has never been shut down for lack of sales.

The Hume-Sinclair Company maintains a well-equipped machine shop at Tiger where machinery, including electrical equipment, is rebuilt. A good stock of repair parts is also kept here. At Foster there is a garage where smaller truck repairs are made and the trucks are serviced.

About 200 men are employed in this operation. They work 8 1/4 hours a

day, and 90 percent of them are employed 6 days a week. Coal is loaded 5 days, and repairs are made on the sixth. Stripping is done 24 hours a day, 7 days a week. When the overburden is thin and enough coal uncovered, coal is loaded 6 days a week. Hume-Sinclair has experienced no serious labor shortage. Fifteen men have left the operations to join the armed forces, but that has been the only important cause for labor turnover. Most of the employes are local men, many of whom live on farms. They are expert at handling the large capacity machinery and are an important reason for the success of these operations.

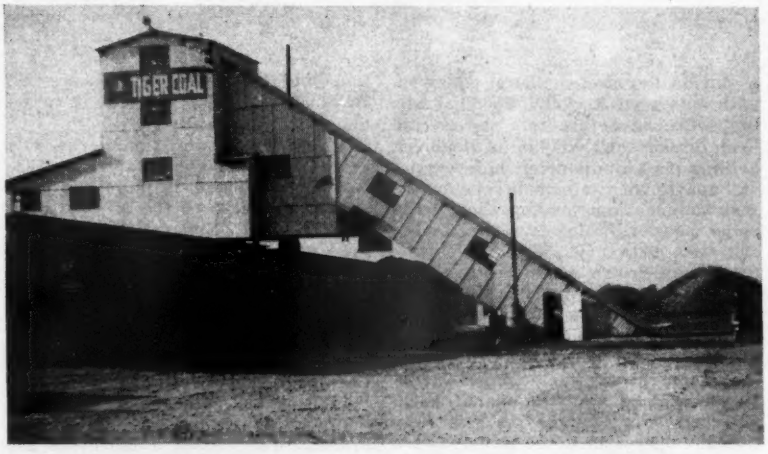
The large stripping shovel removes approximately 1,000,000 cu. yds. of overburden per month, and the small one about 350,000 yds. In one month during the winter of 1943-44, coal production amounted to 142,000 tons. The rate in the fall of 1944 is 80,000 tons a month. The limiting factor on production is the capacity of the stripping units, and thus a policy of mining land with higher stripping ratios in the summer is followed so that increased coal production can be obtained during the winter when demand is largest.

The pits are kept dry by careful attention to surface inflow. The land immediately adjoining the pits is crossed with ditches which lead the surface runoff away from the pit. The water entering the pit is pumped out by portable electric or gasoline centrifugal pumps. Rubber hose is used to carry the water away.

The Eastern Kansas Utilities Company supplies the electricity to operate the shovels, drills, pumps, tipple and washing plant machinery. It is obtained from the generating stations of the Kansas City Power and Light Company, and is brought in to the property at 33,000 volts, 3 phase, alternating current. The utilities company transforms the current down to 4,400 volts. The shovels and loaders are run at this voltage, lower voltage being obtained for the other machinery from company - owned transformers. Those for the pit low-voltage motors are mounted on wheels, so that they can be moved whenever necessary. These transformers are kept close to the pit edge, so the length of low-voltage transmission is kept at a minimum. The high-voltage (4,400) lines are strung on poles until the pit is reached. Here the current for the shovels is put through a single, rubber-covered, three-wire cable.

The Hume-Sinclair Coal Company staff consists of Grant Stauffer, president; L. Russell Kelce, vice president and general manager; Merl Kelce, general superintendent; Ted L. Kelce, superintendent; Don Johnson, assistant superintendent; and Roy Houck, master mechanic.

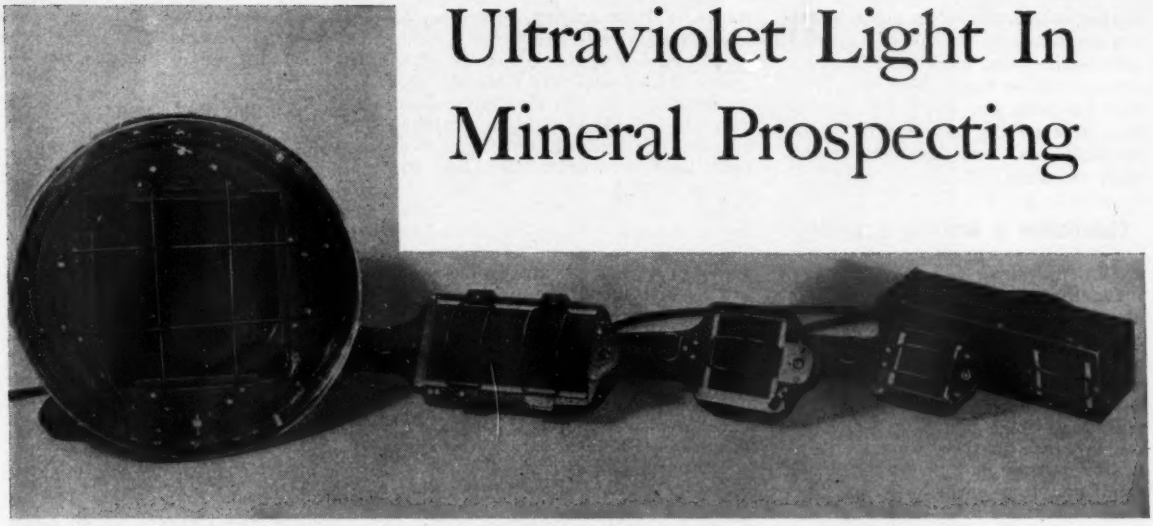
An electric auger drills holes 60 ft. into the overburden. Horses will move the drill to the next location



The Hume-Sinclair tipple at Foster receives the mine product for loading into cars for the rail trip to Tiger. It can also screen coal for the market

Rail yard at Tiger. A car of coal for market is passing over the automatic scales. Main line of Kansas City Southern R.R. is at the right

Ultraviolet Light In Mineral Prospecting



Ultraviolet light sources are available in different shapes and sizes to meet variable demands

The Character and Sources of Suitable Ultraviolet Light and the Numerous Uses to Which It May be Put in Mineral Exploration

By JACK DE MENT
Research Chemist
Portland, Oreg.

DOES not prospecting by a blind man seem illogical to a person with sight? Yet this is what much of our present-day mineral prospecting consists of, for those who go into the field actually have an extra pair of eyes at their disposal and few of them know it.

And seemingly as illogical is the man with vision who endeavors to stake a claim from prospecting only in the darkness of night. But the extra pair of eyes available to the prospector does enable him to prospect at night, often with results that he could not obtain by the most careful study in daytime.

This extra pair of eyes is the ultraviolet lamp. With such a lamp the prospector is enabled to detect by simple methods dozens of valuable ores.

What Luminescence Means

There have been many definitions of fluorescence, though few have conveyed ideas which are strictly accurate to the chemist and physicist and at the same time understandable to the layman. Luminescence, the broad term underlying the effects created by the ultraviolet lamp, is the emission of energy, generally as visible light, from a substance under the influence of an exciting agent. It is a general term applied to light independent of incandescent heat. And luminescence covers all forms of light emission excepting those due to a body by virtue of its temperature. When a body is light-emitting by virtue of its temperature it is spoken of as incandescent or candoluminescent.

The term fluorescence implies light emission from a substance only as long as the exciting agent is present, being for ordinary purposes a transient phenomenon. Phosphorescence or afterglow is physically identical with fluorescence except that the emission of light continues after the source of excitation has been removed. In fluorescence the emission of light

Instrument for field prospecting

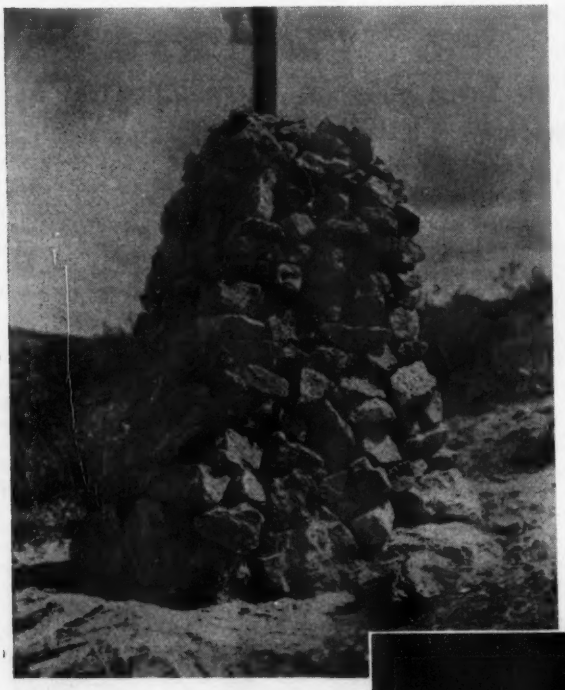
The author would like to acknowledge assistance from Mr. T. S. Warren, Ultra-Violet Products, Inc., Los Angeles, Calif., for making available the illustrations contained in the present paper.

ceases at practically the same instant the excitation is cut off, but in phosphorescence the glow may continue for minutes or hours after the excitation has been removed. The distinction between the two is purely phenomenological and historical rather than scientific.

Classification is According to Exciting Agent

Luminescence, either fluorescence or phosphorescence, can be classified according to the exciting agent used to produce it. The most familiar excitant is ultraviolet light, commonly known as "black light," that band of radiation which extends below the visible range in the spectrum, being on the purple and blue end of the spectrum. In scientific research many forms of light energy, including X-rays, radium rays and various forms of ultraviolet light, are employed to create fluorescence in minerals and other substances. In the practical application of black light to mineral prospecting a certain kind of ultraviolet light is generally used, and this can be divided into two classes: (1) "Short wavelength ultraviolet light" and (2) "Long wavelength ultraviolet light." The principle attributes of these two kinds of ultraviolet light will be discussed presently.

When light is absorbed in certain kinds of matter, like scheelite, it will, if it is the proper kind of light, be subsequently given out again in light of another quality. For example, if scheelite is placed under X-rays, radium rays, or short wave ultraviolet light it will absorb these invisible radiations and, acting like what might be called a "light transformer," give them off again as light visible to the eye. In scheelite this takes place only as long as the scheelite is being acted upon by the invisible rays, being a case of fluorescence. If fibrous willemite is used instead of scheelite the invisible rays can be taken away and the substance will continue to give off light for some time, being a case of phosphorescence.



Above: Stone monument in daylight gives no clue as to mineral values

Right: At right the same monument under ultraviolet light exhibits strong showings of scheelite

Ultraviolet Sources

Primarily significant in any application of fluorescence and ultraviolet light is the source of the latter. There are many light sources available, but if effective results are to be obtained the lamp should be chosen rather carefully with an eye to the use for which it is intended. The user of the lamp should have in mind the previously mentioned distinction between short and long wavelength ultraviolet light. The various lamps vary somewhat in their output in so far as the two classes of ultraviolet light are concerned, and these must be borne in mind when a lamp is being obtained.

Incandescing mercury vapor under suitable pressure, temperature, current and voltage conditions emits a preponderance of either short or long wavelength ultraviolet light. A low-pressure mercury vapor lamp, like the Mineralight, is perhaps the best example of a lamp releasing the short waves, those radiations which are best for mineral work. This consists of a small amount of mercury, together with inert gases, sealed within a fused silica tube at a low pressure. When a high potential electrical discharge is passed through the tube the lamp lights up with a pleasant pale blue color. However, the blue light makes up only a few percent of the total radiation generated by the unit. The preponderance of the light is invisible, consisting of highly energetic short wavelength ultraviolet light lying at 2537 Angstroms.

Short Wave Ultraviolet is Best for Minerals

If the silica tube containing mercury is operated at greater temperatures and with different current consumption another kind of ultraviolet light will be created. Its radiations, the long wavelength ultraviolet light, carry less energy, and lie closer to the visible part of the spectrum than do the rays from the lamp like the Mineralight. The long wavelength radiations are designated tentatively by the wavelength 3650 Angstroms.

The principal difference between the two, as far as the prospector is concerned, is in their relative abilities to cause fluorescence and phosphorescence in minerals. Thus, the short waves will cause scheelite to fluoresce, whereas the long waves generally do not. Phosphorescence is better evoked by the short waves. On the other hand, long waves are

A card-type analyzer has been made available which detects variations in the molybdenum content of scheelite

believed by many to be the better for work on dyes, organic chemicals, and the like.

The Mineralight is an example of the cold-quartz tube, which may be had in any desired shape; it possesses an electrode at each end. Such a unit is also provided with a small step-up transformer to provide the proper voltage. Such lamps are practically cold in their operation: hence the name "cold-quartz" tube. The fused quartz permits passage of the short wavelength light, which is filtered out if ordinary glass is used. Such lamps have had a very useful life for as long as 20,000 hours.

High-pressure mercury arcs are examples of long-wave units. They also require a step-up transformer, but their energy loss through heat is much greater than in the cold-quartz tube. The life of the best high-pressure mercury arc is generally within a thousand hours. The intensity of the particular kind of ultraviolet light they generate is great, and with them a beam of black light may be projected for 30 ft. (for the 100-watt lamp). The so-called "black bulbs" are also sources of the long waves. They are merely a photoflood lamp with a special glass filter for eliminating the visible light. As a rule, the black bulb is unsatisfactory for mineral prospecting, since it does not cause fluorescence in many economically important ores, is short-lived, and heats up quickly so that it can be used for only a few minutes at a time.

All ultraviolet light sources release more or less visible light during their operation. So it is necessary that they be equipped with a special glass filter if they are to be used for observing fluorescence. Since the fluorescence is visible light, it is important to eliminate visible light from the lamp which would otherwise mask the final effect.

Uses of the Lamp

A wide variety and large number of uses have been found for the ultraviolet lamp in mineralogy. Thus, it is valuable for field work, since fluorescence enables a prospector to examine a rock and draw conclusions about its nature which would otherwise necessitate expensive chemical and physical analyses. Very small amounts of a mineral species can be instantly detected in other material by its fluorescence. Closely related minerals present together in the same matrix can often be distinguished under the lamp. Likewise, alteration products are differentiated from their parent species by the fluorescence characteristic.

The ultraviolet lamp made possible, in 1941, the discovery of a body of scheelite in the Salmon, Idaho, district worth a hundred million dollars, the largest of its kind within the borders of continental United States. Tailings are most profitably examined with the lamp. Warren has cited the astonishing case of a prospector who, for years, had thrown tailings onto the dump in his search for gold, only to later find that the scheelite present in the tailings would have paid the operating expenses of the mine. Tungsten ores are discussed presently.

Most uranium ores, with the exception of primary uranium minerals, fluoresce bright yellow or green. This enables their detection in the field and their sorting on the grading table. Moreover, radium is indirectly prospected with the lamp, since this element is invariably present in uranium ores.

Petroleum and Gem Detection

One part petroleum can be detected in a hundred thousand parts mud, water or diluting earth by fluorescence. Drill cores, bailings, and almost any rock can be examined for petroleum. Just recently a patented method of petroleum exploration has revealed the possibility of prospecting bodies of petroleum without ever having to drill. Soil samples are used and these are studied for fluorescence, since deep bodies of oil release hydrocarbon gases which diffuse upwards to be taken up by bacteria present in the subsurface soil and changed into brightly fluorescent substances.

There is much literature on the luminescence of gems. As yet, few conclusive statements can be made about the possibility of prospecting for gems with the lamp. Zircon can be revealed by its bright golden or yellow fluorescence in sands or gravels, and infrequently this is possible for the diamond present under similar circumstances. All diamonds, however, do not fluoresce: a few exhibit a blue, green, or red fluorescence, whereas most others do not.

Things to Remember in Prospecting With Ultraviolet Light

In using the ultraviolet lamp for mineral prospecting a few simple things should be remembered. First, there are about one hundred minerals which can be said to fluoresce characteristically under the lamp: perhaps an additional two hundred present an appearance which is semi-characteristic. It is advisable to obtain a small set of known fluorescent minerals and become familiar with them in the laboratory before ever attempting to use the lamp extensively in the field. Ultra-Violet Products of Los Angeles provides representative sets of fluorescent minerals free of charge to those who buy their lamps.

Second, the lamp is used in darkness or semi-darkness since the fluorescence may be feeble. Hence the idea of prospecting at night. During the daytime a large black cloth, several feet square can be placed over the head and used for the inspection. For more refined work it is recommended that a special viewing box be employed. Such a box enables inspection under more ideal conditions.

It is advisable to examine fresh surfaces under the lamp, though this is not absolutely necessary. When studies of pannings are made it is not important to drain all the water off, though the material in the pan should be substantially free from a covering of water. For pannings, sands, and very small specimens a magnifying glass is of considerable aid.

Tungsten Ores—Assayed Quickly

The luster and color of scheelite may very closely resemble the various gangue materials in which it is often found. This mineral disseminated throughout quartz, lime-silicates and the like, either in a pulverulant form or as crystals, is not always easily seen in white light. The gangues in which scheelite is usually found do not exhibit a fluorescence of the color or brightness that the tungsten ore does.

Pure scheelite usually fluoresces under the Mineralight with a characteristic blue color, but this may range into white or yellowish hues. The fluorescence of scheelite is directly related to the proportion of molybdenum in the crystal lattice of this mineral, and when the transition from pure scheelite or $CaWO_4$ to powellite or $Ca(W,Mo)O_4$ is complete the fluorescence generally appears flesh colored.

Assaying scheelite veins under ultraviolet light has come to be a recognized method for prospecting this mineral. According to Joliffe and Folinsbee and several other writers it is quite accurate. It is stated that the exposed area of the vein is thoroughly cleaned, divided into sections with chalk lines, and the surface area of the scheelite measured. The percentage of WO_3 is the total of the scheelite areas in square inches, divided by the total area of the vein surface measured in square feet, and multiplied by 1.2. D. C. McLaren has given this as follows:

$$\% \ WO_3 = \frac{\text{Sum of scheelite in square in.}}{\text{Total area of vein surface in sq. ft.}} \times 1.2$$

Scheelite Sampling Technique

Walker advises the following for sampling scheelite veins with the lamp:

1. The vein is stripped and trenched longitudinally for the complete length showing scheelite.

2. Markers are placed at 10-ft. intervals alongside the trench.

3. Starting from one end the vein is cleaned as much as possible with a steel brush followed by a whisk.

4. The 10-ft. sections are divided in half by using a standard 6-ft. tape and marking with red or blue pencil across the vein.

5. The canvas cover is placed over the body of the man using the lamp and by means of the grading card and lamp he works from one end of the section to the other calling out the scheelite areas as he lamps them.

6. The assistant using a counter keeps the total of the scheelite areas as they are called out.

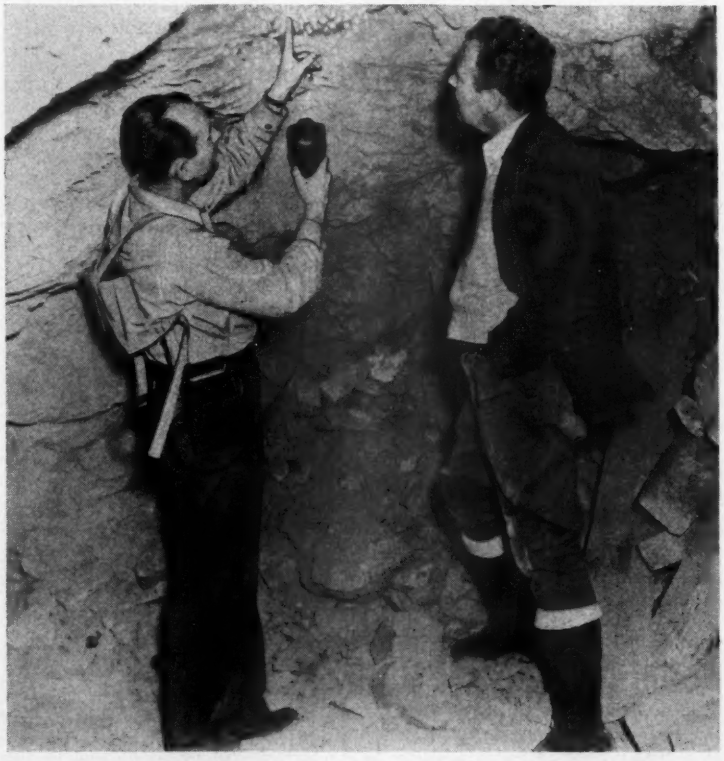
7. When the lamping is completed notes are entered as to the section footage (0 + 15 to 0 + 20), average width of vein and scheelite, dip, etc.

8. If a slide rule is carried the percentage of WO_3 may be worked out by the formula at the same time.

Best results are obtained with scheelite areas of 1.0 to 0.01 square in., in areas larger than one square in., the estimates will be erratic unless large surfaces are examined. Attention must be paid as to whether the scheelite is massive or occurs as thin layers along the fractures. In the latter case areas exposed along fracture surfaces are larger than the thickness of the mineral, thus resulting in over estimation. Finely disseminated scheelite is difficult, and much guess work must be used in estimating areas.

How to Use the Grading Card

The grading card mentioned above by Walker consists of a dozen prepared samples giving fluorescent responses similar to an active sample of scheelite, employed to determine



A fresh surface should be exposed before making the inspection

the amount of molybdenum in various samples of scheelite. The grading card was developed by R. S. Cannon and K. J. Murata who found that, in general, concentrates that are not penalized for molybdenum can be obtained from any scheelite that fluoresces distinctly blue. Those that fluoresce white are borderline cases containing roughly from 0.35 to 1.0 per cent, and scheelite that fluoresces distinctly yellow contains more than 1 percent.

More exact quantitative determination of the molybdenum content of any scheelite containing less than 4 percent can be quickly made in the field by comparing the fluorescence color of the powdered mineral with the fluorescence colors of the powders of known composition, the latter of which make up the grading card. In making up a grading card the "known" slides can be made from assayed tailings or mineral containing increasing amounts of WO_3.

Some General Warnings

In scheelite exploration with the ultraviolet lamp a fresh surface should always be exposed before making the inspection. Various alteration products and coating may negate the results, and best studies are made after the samples have been pulverized. A few non-tungstenic minerals resemble scheelite insofar as fluorescence is concerned. The principal ones are certain calcites and dolomites, brucite, barite, gypsum, hydrozincite, wollastonite, diopside, cerussite, and certain opal and hydrous silicas. Thomas Warren has even pointed out that some live animals, like toads and lizards, may present fluorescence. He advises that the fluorescent area be stepped upon before being picked up by the hands in order to avoid accidents.

Most of the Heavier Tungsten Minerals Do Not Fluoresce

The alkaline earth tungstates and molybdotungstates are the principal members of the family of tungsten minerals which exhibit a bright and more or less characteristic fluorescence, at least from a practical standpoint. The heavier tungsten minerals, like the tungstates of copper, lead, iron or manganese, do not fluoresce at all or at least characteristically enough for purposes of prospecting. Tungstite does not fluoresce. In some areas, in the case of scheelite and powellite, the change of fluorescence with the gradual transition of one to the other is very marked. There is, perhaps, one exception about the fluorescence of heavier tungsten minerals which should be remembered, and that is the case of cuproscheelite. This mineral $(Ca, Cu)WO_4$, often shows a bright fleshy yellow fluorescence, but little work has been done upon it. It is not known with certainty whether the fluorescent tungsten minerals possess a marked phosphorescence: this property has not been connected with prospecting for these minerals with the lamp.

Ultraviolet light is increasing in usefulness in the mineral industry. Here it has been made helpful on a sorting belt

Mercury Detection and the Fluorescent Screen

The ultraviolet lamp, as mentioned before, is especially adapted for the prospecting of ores and minerals besides those of tungsten. As little as one-thousandth of 1 percent of mercury can be easily detected by use of a fluorescent screen and the lamp. The method is simple and quite spectacular. Several variations of it can be employed, according to the circumstances. Briefly, the screen method consists of heating the rock sample in front of a fluorescent screen which is illuminated in darkness by an ultraviolet lamp. In the presence of mercury, deep purple-black vapor-shadows will be seen rising from the sample. The fluorescent screen can be made by coating cardboard or wood with powdered willemite, being bound to its carrier with ordinary glue; or, an old X-ray fluoroscopic screen will do just as well. The sample can also be covered with a powdered fluorescent mineral or synthetic phosphor, like zinc orthosilicate or zinc sulfide, heated, and examined under the lamp. In this test the sample will appear to be "steaming." In the mine the operator can use a gasoline blowtorch for heating and carry his lamp and screen along with him.

Zinc Minerals are Interesting

Several ores of zinc show a very bright fluorescence. This enables prospecting, and grading and sorting in the mill. Zinc orthosilicate or willemite, from the Franklin, N. J., locality shows a bright green fluorescence; fibrous varieties may, in addition to this, exhibit an intense white or greenish afterglow. The New Jersey willemites are highly prized as show-case specimens because of their fluorescence. The calcite which accompanies the willemite contains traces of manganese which give rise to a beautiful red or pink fluorescence, though the franklinite, which is also present, appears only a deep purple color. On the tables, lamps are used for grading, to very great advantage. It is important, however, to use gloves and protective goggles, since the rays from a cold-quartz lamp can cause severe sunburn on the skin and eyes.

Zinc sulfides or sphalerite also fluoresce. Generally this is an orange color with an afterflow which depends upon the foreign element content, especially manganese, and upon the locality. The Tsumeb, South Africa, sphalerite shows fluorescence and phosphorescence and, if struck sharply with a metal object, will emit light which is known as triboluminescence.

Secondary Uranium Minerals

As a rule, the primary uranium minerals do not fluoresce brightly, but the secondary minerals do. Pitchblende and carnotite do not possess flourescence, but their altered products, like zippeite, appear bright yellows or

(*Continued on page* 37)

Large Scale Tailing Reclamation Plant In Southwestern Wisconsin

A 3,000,000-Ton Tailing Pile is Being Reclaimed in the New Cokerville Flotation Plant at the Rate of 2,400 Tons per Day

By G. H. PETT
Professor of Mining and Ore Dressing
Wisconsin Institute of Technology
Platteville, Wis.

THE Wisconsin Zinc District, an area of approximately 2,500 square miles, located in the southwest corner of Wisconsin, has dotted on its surface a series of tailing piles, large and small, resulting from the mining of lead since 1822 and zinc since 1862.

In the northern part of this district are located two of the largest tailing piles, one containing 1,200,000 tons, known as Coker No. 1, and another one near by, containing 600,000 tons, known as Coker No. 2. The reclaiming of these two piles is the subject of this article.

Origin of Tailing Piles

These tailing piles are the result of jigging an ore composed of sphalerite, galena, and marcasite with a gangue of secondary calcite, together with the country rock of dolomitic limestone. Occasionally a small amount of barite is found in some localities, and a small amount of smithsonite (zinc carbonate) is found in practically all ores in the northern part of the district. At the base of the ore bearing formations is a thin bedded carbonaceous shale known as "oil rock," a small amount of which becomes part of the gangue in the mining operations.

The chief commercial mineral in mine ore was sphalerite with galena as secondary. These two commercial minerals were recovered in a gravity concentration process in which jigging was the typical feature. This type of mill recovered on an average of 70 percent of the zinc and 80 percent of the lead. The 30 percent zinc loss was found to be distributed as follows: 10 percent of the total zinc in the run-off fines or sludge; 2 percent in hand-picked waste; and the remaining 18 percent in the tailing piles. It is this 18 percent loss in the tailings that furnishes the impetus for this economic exploitation.

General view of plant. Trucks feed 15-ton hopper over belt conveyor. Material is sent to mill or to storage tank as desired

SCREEN ANALYSIS OF TAILINGS

	Percent of total weight	Assay Percent Zn	Percent of total Zn
Composite	100.0	1.15	100.0
On 4-mesh	26.4	.92	21.1
Through 4- on 8-mesh	24.6	.76	20.2
Through 8- on 10-mesh	6.2		
Through 10- on 65-mesh	32.4	1.58	58.7
Minus 65-mesh	10.4		

Abbreviated Screen Analysis

The following abbreviated screen analysis was taken from a composite sample recently obtained from the incoming tailings, over a three-day period, at the northern end of the pile. It shows that over 50 percent of the total zinc is in the minus 10-mesh material, which is less than one-half of the total weight of the tailings. The results agree closely with the original sampling data, but better results are expected, since it is known that the zinc content increases toward the southern end of the pile.

The lead and iron analysis is not shown because the lead is of such

small amount and the iron averages about 4 percent throughout the various size ranges.

The Test Work

The laboratory tests all bore out the fact that pre-concentration of the crude tailings to between 5 and 10 percent Zn, followed by flotation, would result in a good recovery and if carried out on a large scale could be a profitable venture even though the market price for Zn took a substantial drop. But a large-scale operation such as this would entail a large plant investment. More conclusive proof was therefore required and it was decided that if these crude tailings showed a reasonable recovery by actually running them through an operating flotation plant, there should be no doubt in the mind of those concerned that the contemplated plant investment could be amortized in three years in addition to a substantial profit for the operating company.

Accordingly, 60 tons of tailings were hauled 21 miles to the Dodgeville Mining Company, whose management had agreed to rent the plant for eight hours on a Sunday when they were not operating. On a Sunday in July, 1943, 60 tons of tailings were pre-concentrated in a 6-cell Harz-type jig, and this jig concentrate was then the flotation feed for the 35-ton flotation plant. Since so much depended on this test, it would not be amiss to show the metallurgical results.

These results were most gratifying to those concerned and bore out the fact that a large plant actually designed for this type of material would prove most successful. Of special concern was the flotation recovery, since the tailing piles had been exposed to the elements for many years. The jig recovery can always be improved, but since flotation is largely a matter of surface chemistry, a reasonable economic recovery cannot always be attained, especially should certain interfering elements be present.

METALLURGICAL RESULTS OF 60-TON TAILING TEST

Product	Pct. Zn	Pct. Fe	Pct. Pb	Pct. CaO	Recovery Pct. zinc
Original tails heads	1.02	4.35	0.08	22.10	
Jig concentrate	6.40	6.05	0.38	17.40	58.0
Jig tails	0.47	2.95	None		
Flotation zinc conc	63.10	2.50	0.28	0.16	93.0
Flotation zinc tails	0.50	7.75			
Table leads	1.60		61.20		

There are four cells in the lead circuit and eight in the zinc circuit

Dual Purpose of This Plant

The mill was built not only as a tailing retreatment plant but also as a concentrator for mine ore, and was designed according to a flow sheet by Mr. R. A. Schott, mining engineer of Chicago, and the writer. Its construction was financed by the Defense Plant Corporation, and it is operated under a lease agreement by the United Milling and Mining Company of Wisconsin. The tailing piles are owned by the Empire Zinc Company, a subsidiary of the New Jersey Zinc Company, and are leased on a royalty basis to the operator.

The tailing piles alone, even on a stepped-up daily tonnage of 2,400 tons, would last three years. In addition, there are several hundred thousand tons of underground mine ore blocked out, which the operating company expects to develop in the near future, so that mine ore can be milled in the winter and tailings in the summer, because operating costs in the reclaiming of tailings are materially increased during the winter months.

No changes are necessary to switch from the milling of tailings to mine ore, and the only difference is the handling of a richer feed. Of course, if by selective mining a mine ore of 8 percent zinc could be obtained, pre-concentration would not be as economical as direct flotation (at present market price), and the jigs would be by-passed.

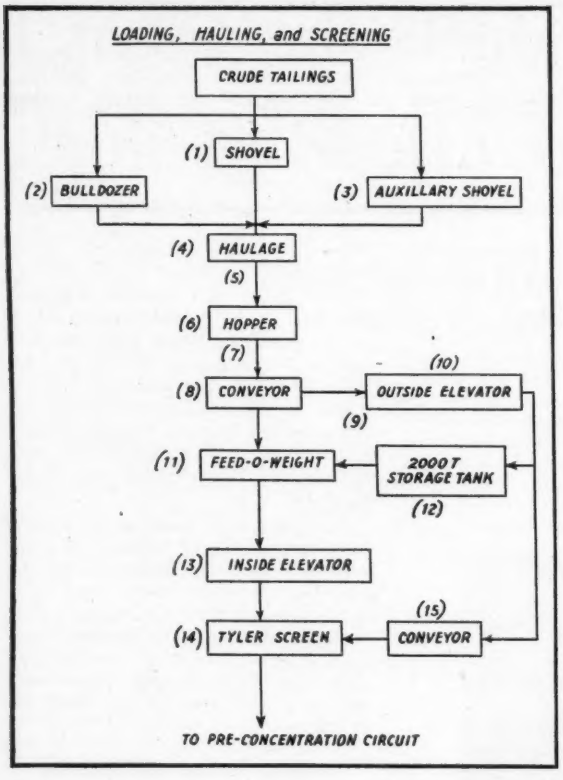
Loading, Hauling, and Screening

A 1½-yd. gasoline shovel operating 24 hours per day loads the tailings into two 10-ton bottom-dump trucks which transport their load one-fourth of a mile to the mill. The trucks dump on a 3-ft. by 10-ft. grizzly with openings 6 in. square, covering a 15-ton hopper which feeds a 30-in. conveyor belt, in turn feeding another double-chuted hopper.

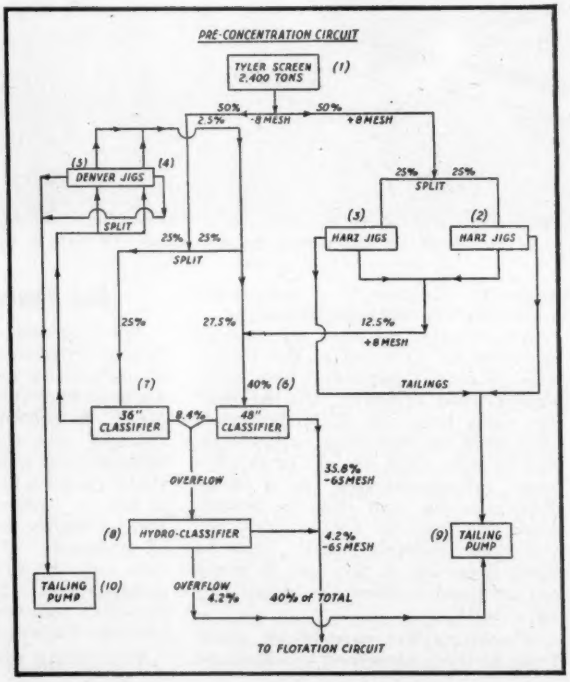
One chute leads to an elevator boot which feeds a large 2,000-ton emergency storage tank, while the other chute can feed the feed-o-weight leading directly to an elevator in the mill. The latter discharges onto a double-deck vibrating screen, the upper deck acting as a trash screen with ½-in. openings, while the material retained on the 8-mesh lower deck screen furnishes the coarse feed for the two Harz jigs.

The minus 8-mesh material, after being deslimed in a 36-in. spiral type classifier, becomes the fine-sand feed for the two Denver jigs. Besides the 2,000-ton emergency storage tank, another 2,000 tons of tailings are stockpiled near the grizzly and pushed in with a bulldozer. These precautions are taken in the event that the trucks or shovel are out for repairs.

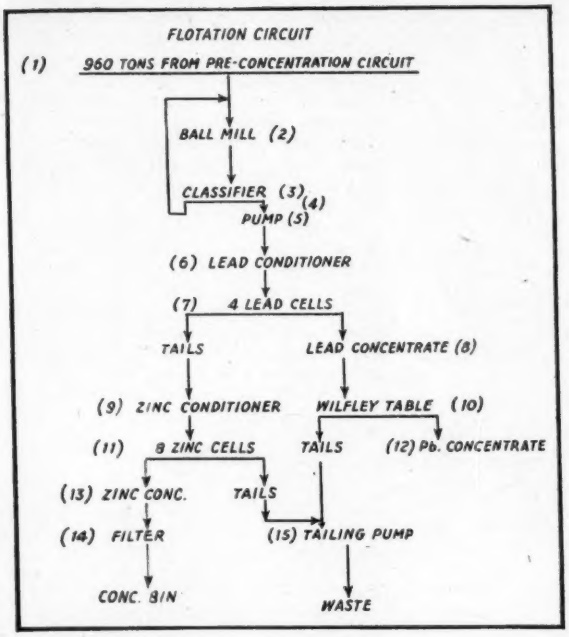
In summer the loading shovel need operate only eight hours per day to fill the 2,000-ton storage tank, but in winter the shovel operates 24 hours per day so as to keep a frozen crust of tailings at a minimum.



1. Gasoline shovel, 1½-yd.
2. Bulldozer, 85 hp.
3. Shovel, ½-yd.
4. Bottom dump trucks, 10 T.
5. 3 ft. x 10 ft. grizzly, 6 in. openings
6. Hopper, 15 T.
7. Dings suspended magnet
8. Belt conveyor, 30 in., 41 ft. centers, 250 T./hr.
9. Split hopper
10. Outside elevator, 170 T./hr.
11. Feed conveyor, 20 in. belt.
12. Storage tank, 30 ft. diameter, 40 ft. high
13. Inside elevator, 110 T./hr.
14. Tyler screen—double deck, top deck ½-in. openings, bottom deck, 8 mesh
15. Overhead conveyor to by-pass storage tank and feed-o-weight and inside elevator



1. Tyler screen, 5 ft. x 12 ft. Double deck—top deck ½-in. in opening, bottom deck, 8 mesh
2. Harz jig, 5 cell, 30 x 36 in.
3. Same as 2
4. Denver duplex jigs, 24 in. x 36 in.
5. Same as 4
6. Wemco classifier, 48 in.
7. Wemco classifier, 36 in.
8. Hydro-classifier, 12 ft. diameter
9. Allis-Chalmers special type coarse sand pump, 6 in.
10. Hydro-seal pump, 4 in.



1. Flotation Feed, 960 tons, averaging 3% zinc.
2. Ball Mill, Kennedy-Van Saun, 7 ft. x 5 ft., combination drum and scoop feed.
3. Wemco Classifier, 48 in.
4. Classified Overflow, 5% plus 65 mesh.
5. Hydro-Seal Pump, 4 in.
6. Lead Conditioner, 6 ft. x 6 ft.
7. Lead Cells, 3 roughers, 1 cleaner, Denver Sub-A, 56 in. x 56 in.
8. Lead Concentrate, contaminated with oil rock and iron.
9. Zinc conditioner, 10 ft. x 10 ft.
10. Standard Wilfley Table for cleaning lead concentrate.
11. Zinc cells, Denver Sub-A, 56 in. x 56 in., 6 roughers, 1 cleaner, 1 recleaner (if necessary).
12. Finished lead concentrate, average 60% grade.
13. Zinc concentrate, average 61-63%.
14. Filter, Eimco, 4 ft. diameter, 6 discs.
15. Hydro-Seal tailing pump, 4 in.

Pre-concentration

If the crude tailings were taken as a whole and sent through a Harz-type jig, the zinc recovery would only be about 58 percent, as was shown by the foregoing test, but by feeding sized products to different types of jigs the zinc recovery can be materially increased.

The coarse sand concentration (minus ½ in. plus 8-mesh) is brought about in two Harz jigs, each machine having five 36-in. by 30-in. cells, and handling 400 tons per 24 hours each. The capacity of each of these jigs has been increased by 50 percent, which was accomplished by increasing the drop between each successive cell to 3 in. instead of the present 1½ in. This will decrease the efficiency very little due to the type of feed being handled.

The fine-sand concentration, namely minus 8- plus 65-mesh, is accomplished in two 36-in. by 24-in. Denver Duplex mineral jigs, each jig taking approximately 300 tons of daily feed. Using a Denver mineral jig for this type of work is a departure from its usual method of operation, which is to work in closed circuit with a ball mill and classifier, its tailing going back into the circuit. In this plant, however, each jig operates in open circuit and rejects a finished tailing. The crude tailings have now been graded up to an average concentrate of 5 percent zinc with a 75 percent recovery.

Flotation

The flotation division consists of four cells in the lead circuit and eight in the zinc circuit, all of which are Denver Sub-A No. 30 (56 in. by 56 in.).

The flotation feed, consisting of 360 tons of jig concentrates, together with 100 tons of minus 65-mesh material from the crude tailings plus 500 tons of crude tailings, is ground in a 7-ft. by 5-ft. Kennedy-Van Saun grate discharge ball mill in closed circuit with a 48-in. Wemco classifier. The classifier overflow, maintained at 40 percent solids, is pumped to a 6-ft. by 6-ft. lead conditioner from which the pulp with a density of 33 percent solids and pH of 8.0 flows by gravity into No. 2 cell of the lead circuit. This circuit operates with cells Nos. 2, 3, and 4 as roughers and No. 1 as the cleaner. The rougher lead tailing is the feed to the zinc circuit and flows by gravity to a 10-ft. by 10-ft. zinc conditioner, which discharges a pulp of 30 percent solids and pH of 8.2 into cell No. 3 of the zinc circuit, of which cells 3 to 8 are roughers, cell No. 2 is the cleaner, and cell No. 1 the recleaner when recleaning is necessary, which so far has not been needed. Table below shows the reagent consumption in pounds per dry ton of flotation feed.

A very noticeable feature of this table is the remarkably low amount of reagents used.

The lead cleaner froth, which is highly contaminated with oil rock and iron sulphide, is cleaned on a standard Wilfley table, giving a small amount of 60 percent lead concentrate with a 50 percent recovery. No filter is used because of the small amount of lead produced.

The zinc cleaner froth flows directly to a 4-ft. Eimco 6-disc filter. Only three discs are used in order to give a drier filter cake. The zinc recovery averages 93 percent and the concentrate produced averages 61.3 percent Zn and 1.8 percent Fe.

Reagent	Point of addition	Pounds per ton
Aerofloat—25	Ball mill	0.032
Soda ash	Ball mill	1.5
Sodium cyanide	Ball mill	0.005
Copper sulphate	Zinc conditioner	0.75
Lime	Zinc conditioner	0.5
Sodium Ethyl xanthate	Conditioner overflow	0.03
Cresylic acid	Conditioner overflow	0.04

Flexibility of Plant Operation

In order to keep the flotation division running as continuously as possible, even though most of the remainder of the plant should be shut down because of trouble or repairs, another 48-in. Wemco classifier has been installed recently. Just this one small addition makes it possible to do the following: (1) By-pass one or both Harz jigs, (2) by-pass one or both Denver jigs, (3) by-pass all jigs and feed 1,000 tons of crude tailings to the ball mill per 24-hour day.

These changes can be quickly made by adjusting the feed-o-weight, thereby changing the amount of feed coming into the mill and throwing from one to three deflecting gates in the takeoff spouts from the double-deck vibrating screen.

The deficiency in jig concentrate due to one or more being shut down is made up by adding that deficient amount in the form of crude tailing, so as to maintain the correct amount of ball-mill feed and also a constant pulp density.

Feeding crude tailing to the ball mill and flotation circuit is far more profitable than not running the flotation division at all during short shutdowns in the jig or gravity concentration division. Not only does it take at least two hours to bring the flotation circuit back to normal after its shutdown but there is also danger of having the conditioners and several intake pipes sanded in.

To be sure, a jig concentrate bin or surge tank would answer the same purpose, but it must be borne in mind that this plant was designed not only for reclaiming tailings but also for concentration of mine ores. Therefore, the change for running in crude tailing to the ball mill is exactly the same path the mine ore would follow. So far a surge tank or ore bin between the gravity and flotation circuit has not been necessary since the tonnage handled in the flotation circuit is so large it takes a considerable fluctuation in feed to produce a noticeable change in pulp density. However, should it be found that a surge tank would increase the flotation efficiency, it will be installed even though it would be rather costly in this case.

Power, Water, and Heat

Power is purchased from the Wisconsin Power and Light Company, coming in at 33,000 volts to a substation containing three transformers each 200 K.V.A., single phase, 60 cycles, which step down the voltage to 440 for the various motors throughout the plant (containing 51 motors in all).

All the milling machinery has individual motor drives which are controlled from two switchboard panels.

A 10-in. Cook deep-well turbine pump of 1,000 g.p.m. capacity raises water from the flooded workings of Coker No. 1 mine and discharges into a 40,000-gal. reservoir. A 6-in. centrifugal pump in the mill draws from the reservoir, discharging into a 5,000-gal. constant-head storage tank.

At full capacity the mill requires 900 g.p.m. No used mill water is reclaimed, because present indications are that it is not necessary.

The 70-ft. by 90-ft. mill building also houses a 185-hp. boiler which furnishes steam for thawing frozen tailing in the storage bin; and also hot water for various purposes, such as furnishing warm water for the flotation circuit if it should be desirable, heating the building, office, and chemistry laboratory.

Beginning and Present Operations

Although the construction of the plant was incomplete by August of 1944, it was decided to begin operations with a nucleus of the plant at approximately three-fourths capacity. This meant that the Denver jigs had to be by-passed so as to have sufficient volume at the proper density in the flotation circuit, which was slightly under 2 percent in zinc content.

After two months of operation as a pilot plant, the capacity was gradually stepped up to 2,000 tons daily and has now been stepped up again to 2,400 tons daily. At present the over-all zinc recovery is 70 percent, producing a concentrate varying between 61 and 63 percent zinc with iron very seldom over 2 percent.

The lead in the tailings is of very small amount at present, but farther back in the tailing piles the lead content increases.

One goal already has been reached; namely, 1 ton of 60 percent zinc concentrate per hour from 2,000 tons of tailing. The next goal to be reached is an over-all recovery of 75 percent which could be attained by further adjustments, especially in the preconcentration circuit, and thus obtain 1¼ tons of 60 percent zinc concentrate every hour.

Unique Features

The following features may not be unique for some of the larger plants in other localities, but for this district they are so regarded:

1. Handling of 2,400 tons of material daily in one section, or unit.
2. Pumping coarse ½-in. tailings in a specially designed centrifugal type sand pump for a distance of 400 ft., with the discharge pipe on a 10-degree incline.
3. Individual motor drives, no line shafts.
4. Flotation reagent consumption very low.

Acknowledgment

Grateful acknowledgment is made to R. A. Schott, in charge of operations, and T. T. Biddle, general superintendent, for permission to present the foregoing, as well as for aid in its preparation.

The 7' x 5' Kennedy-Van Saun grate discharge ball mill operates in closed circuit with a Wemco classifier

IT MEASURES ITS YARDAGE BY THE MILLIONS

The MARION 4161—Ward Leonard—Electric Shovel has been in successful operation for years, digging ore—rock—slag—coal and aggregates for dam construction where YARDAGE is figured "in the millions" and production costs are figured to the fraction of a cent.

MARIONS PRODUCE MAXIMUM YARDAGE at minimum cost. Let us help you with your material handling problem.

THE MARION STEAM SHOVEL COMPANY, MARION, OHIO

Modernize with

MARION

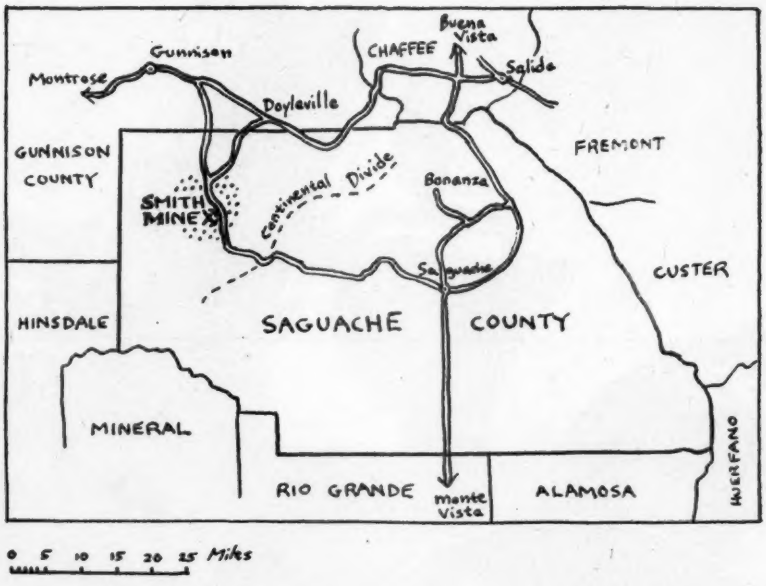
SHOVELS • DRAGLINES • CRANES • CLAMSHELLS • WALKERS • PULL-SHOVEL
COAL LOADERS • STRIPPING SHOVELS • GAS • DIESEL • ELECTRIC (From ¾ cu. yd. to 35 cu. yds.)

Rocky Mountain Quicksilver

A Visit to a Promising New Mercury Enterprise in Saguache County, Colo.

By WORTHEN BRADLEY

President
Bradley Mining Co.



BASED on the results of prospecting to date, cinnabar is a rare mineral in the State of Colorado. It has been found as a minor occurrence in the Gold Sovereign mine at Cripple Creek, and non-commercial showings have been reported from Routt County. Some mercuric telluride was associated with the Gray Eagle ore in Boulder County. Clear Creek County has its Almaden, Great Western, and Red Elephant mines, but the names of these base-metal properties are misleading.

The Ore Indications are Good

It is of interest, therefore, to learn that what seems to be a large body of quicksilver ore (containing both cinnabar and metacinnabar) is now being developed in Saguache County. This should be of particular interest to conservationists and to the War Production Board—which body decided over a year ago that too much quicksilver was being produced, and now is forced to conclude that there is not enough production. Please pardon the editorializing, and go on with the story.

The property was discovered by Asahel T. Smith, of Gunnison, Colo., and is known as the Smith Mercury Mines. Mr. Smith is one of the few old-time prospectors still practicing his trade. He was looking for gold in the fall of 1931, while driving north down Cochetopa (pronounced Coach-e-tope) Creek. At the point where the creek leaves a broad meadow and starts a swifter descent down Cochetopa Canyon, Smith's attention was arrested. The red Cambrian sandstone walls of the canyon appeared mineralized, so he pitched camp and put in a week of prospecting.

Finds Cinnabar

Smith found traces of cinnabar, and followed them about a mile uphill to the west of the creek. The cinnabar mineralization became stronger in that area, and it is there that the present development is taking place. Smith subsequently located over 30 claims, running from a "crater," west of this stronger western end of the property, clear across the creek to the east.

Asahel T. Smith, discoverer of the mine, likes the moniker: "Old prospector himself, mercury hound, 68, but fleet as a wild roe"

In 1941 Smith installed a 2-pipe retort, which has since made a small production of quicksilver from sorted ore. In the summer of 1943 a mining group from St. Paul, Minn., examined the property and in January, 1944, signed a lease on the nine western claims. This group calls itself the Colorado Mercury Mines, Inc.; it is headed by C. J. Lessard, O. F. Norton, and O. J. Dufresne, of St. Paul. C. N. Williamson, formerly of Winnemucca, is their superintendent on the ground, and J. J. Hill is the consulting engineer.

The property is something of a jigsaw puzzle, geologically speaking. To say that the ground is broken and disturbed is an understatement. Starting from the north, the ore lies between an east-west fault in quartzite, 1,800 ft. south of the quartzite-limestone contact; the latter also running approximately east and west. North of the limestone at the western end there is an intrusion of brecciated dike material, tentatively identified as andesite. There is another such intrusion 3,000 ft. south of the lime contact.

Comparatively recent volcanic activity is in evidence. On my visit of September 30, 1944, to the property I did not know of the "crater" men-

tioned above, and did not see it. But Smith later described it to me as a large natural pit, bordered "on three sides by layers and intrusions of rhyolite sinter or tuff." This is at the extreme western end of the property. I did see, scattered over the area I traversed, large quantities of breccia that could have been float from an eruptive deposit. Some of this material contained cinnabar.

The bulk of the ore is found in the quartzite, limestone, and in sandstone, the country rock. Some gold occurs in the croppings, associated with the cinnabar; and, as noted above, there is some metacinnabar. The prevailing dip of the sedimentary beds is to the north.

Development so far has consisted of shallow pits and trenches, which have served to indicate low-grade mineralization over a wide area, with a few higher grade spots. The ore is apparently of shallow deposition, and can be mined from open cuts. At the time of my visit a bulldozer was on its way to assist in the development, which I understand is to be concentrated at the western end, in the quartzite and limestone near the crater, and along the dike.

Gunnison, Colorado, population 1,500, is 27 miles north of the mine

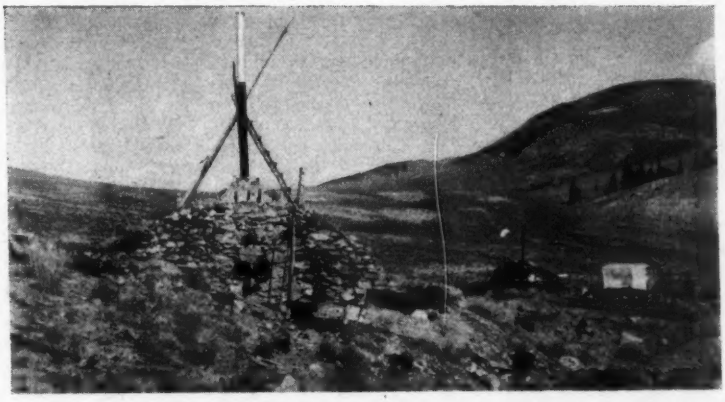
Property is in Attractive Country

I drove to the property from the north, by way of Gunnison, the closest town. Gunnison, with a population of 1,500 and at elevation 7,683, is truthfully described as the "center of a sportsman's paradise." Trout abound in the near-by streams, and road signs proclaim the warning: "Careful — Deer on Highway." A narrow-gauge branch of the Denver & Rio Grande R. R. connects Gunnison with Montrose on the west and Salida on the east.

At a point 8 miles east of Gunnison I turned right from Highway 50 onto Highway 114. At this point Cochetopa Creek comes down from the south into Tomichi Creek, which in turn runs west into Gunnison River, a tributary of the Colorado. "Highway" 114 parallels Cochetopa Creek and is a graded and graveled road, although narrow in a few places. After proceeding 8 miles up this road I passed from Gunnison County into Saguache (Sa-wash) County. Shortly beyond the county line Cochetopa Creek, which up to this point had meandered through a meadow, descends more steeply between higher canyon walls. Still further upstream several miles of well-timbered country are traversed. Then the timber is left behind, the canyon walls become more rugged and closer together, and the road finally breaks out into a comparatively broad valley. Just beyond this break-through, and at a point 27 miles south of Gunnison, I turned right and crossed Cochetopa Creek on a dilapidated log-and-plank bridge. Thence I drove 1 mile to the west, up a road that was little more than a trail, and arrived at the Smith retort and cabin.

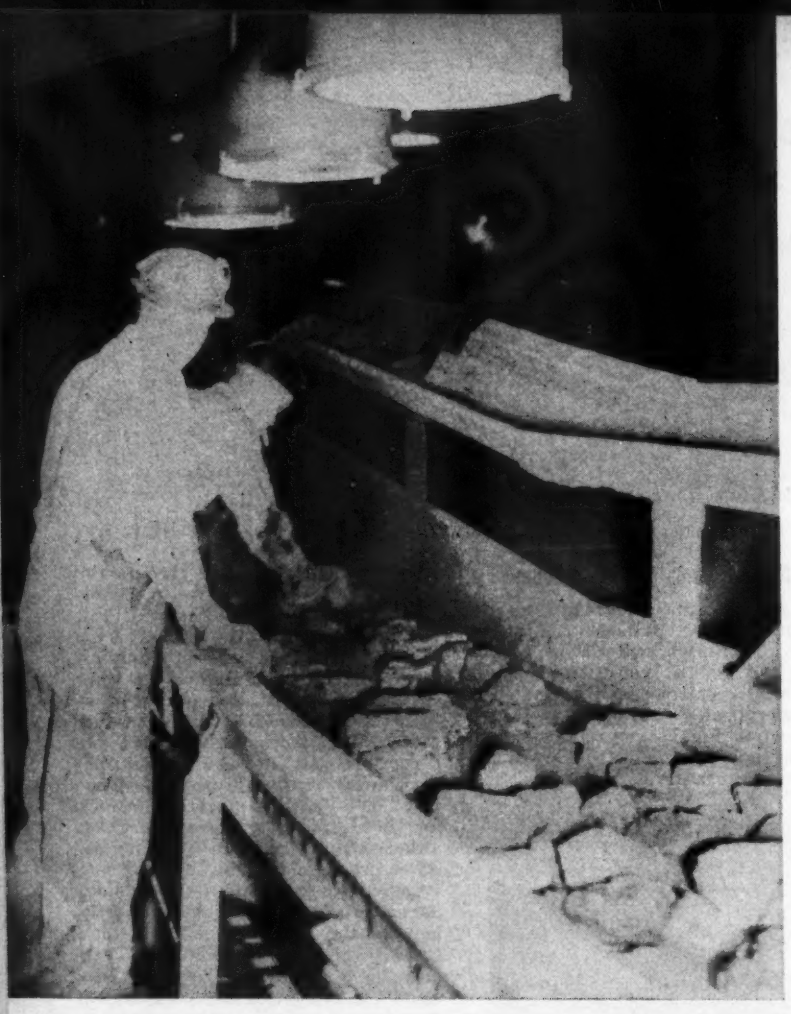
I was now at approximately 8,500 ft. elevation and 10 miles west of the Continental Divide. Another 20 miles further east was the town of Bonanza, site of a gold boom in the '80s and '90s, and more recently the scene of some base-metal activity. There have been no other significant mining operations in Saguache County.

It is to be hoped that, with renewed interest in quicksilver on the consuming end, the Bureau of Mines will in turn show renewed interest in the Smith property, and that the U. S. Geological Survey can also be persuaded to investigate. The property seems to deserve more than the cursory glance which the Bureau bestowed upon it in 1942.



Retort at Smith Mine. Smith's cabin is at right

A portable Ingersoll-Rand compressor serves operations at the inclined shaft in ore. Ore is at limestone-andesite contact



For tipple lighting, one of the most important factors is the location of the lights. Three and one-half feet above the picking belt is the present recommendation

Coal Industry Lighting Clinic

Marketing, Operating and Safety Committees of the Pocahontas Operators Association Meet with Officials and Engineers of Appalachian Electric Power Company to Discuss Better Lighting as an Aid to Producing Cleaner Coal and Greater Safety in Tipples and Mines

RESEARCH in industrial lighting has proceeded along the following lines for some time: (1) Kind or quality of light obtainable from various sources, such as incandescent bulbs, fluorescent tubes, mercury vapor lamps, etc.; (2) intensity or quantity of light and the best means of obtaining it economically; (3) location of the light source with reference to the work and conflict with daylight; (4) direction of the light rays; (5) the problems of maintenance and life length of the many types of units offered. These points were brought out in detail by E. D. Altree and J. C. Smith, Jr., illuminating engineers for the Appalachian Electric Power Company and General Electric Company, Pittsburgh, respectively.

In a paper, "Lighting Aids for Marketable Coal," Mr. Altree strongly urged better illumination for tipples instead of the "gloomination" frequently found. Other speakers called for improvement in tipple personnel as soon as available. The custom of using the preparation plant as a "poorhouse" for old men, cripples and boys was considered wrong, especially where this practice means dirty coal. Since the only excuse for the "poorhouse" feature has been removed through the elimination of the lower wage rate, it is strongly recommended that able-bodied men be placed in these jobs.

At the suggestion of illuminating engineers, one operator arranged for an eye test for the members of his tipple crew and learned that sight deficiency was rather widespread among them. Picking impurities at the table is one of the most exacting visual jobs around a mine. It calls for men with good eyes and very definitely requires that proper illumination be provided for them. One engineer stated that some tests made at certain northern captive mines showed that the coal at the lower end of the shaker screen was higher in ash than at the point of entrance because the men couldn't see well enough to effect control.

The incandescent lamp has been largely outdistanced by better types of lighting in spite of a multiplicity of reflectors and other aids available to it. The so-called daylight (blue)

bulb is an improvement, but certainly not the ultimate in lighting. The Appalachian Electric Power Company has on exhibit (and for demonstration) black light, which is more of a curiosity than a suitable light source in the illumination discussion. It may have some use, however, in areas higher in sulphur than the Pocahontas region, for aid in identification of this impurity. Fluorescent lighting was advised against because it is found difficult to obtain the high intensity lighting required. The high intensity mercury vapor lamp was shown to be most favored today as a source of illumination. A 400-watt size in these lamps is said to equal the standard 750-watt incandescent and the 1,000-watt high voltage incandescent lamps in light output. This is a worthwhile economy note.

For tipple lighting one of the most important factors is the *location* of the lights. Three and a half feet above the picking table is the present recommendation. Glare is thus avoided—it is alleged to cause tired eyes, and tired eyes make tired bodies. Cleaning is certainly a visual task and the proper location of light source is important. Light contrasts are often observed where lights are too high and the daylight through windows conflicts, though daylight is seldom present in quantity even in the best tipples. Some think that daylight, being so unreliable, should be entirely supplanted by proper artificial lighting. Men on tipples have been observed wearing eye shades and even erecting cardboard shields under reflectors located too high and causing glare. Proper spacing of the light sources over the tables is also very important.

The value of proper reflectors was emphasized. Bulbs may be located high or low within them, but in general the mercury vapor lamps have the advantage as they are designed with cooling fins to handle deep-well location. These lamps also have sealed-in glass lenses and need less frequent cleaning. Pulley-mounted lights have advantages as they can be reached for cleaning without climbing; they are also subject to less vibration, an important factor in obtaining the rated life of 3,000 hours.

Mercury vapor lights have been installed in many places in the Pocahontas field. The Arista tipple of the Weyanoke Coal and Coke Company, the Amonate tipple of the Pocahontas Fuel Company, Inc., tipples of Algoma Coal and Coke Company, United Pocahontas Coal and Coke Company, and Turkey Gap Coal and Coke Company have all installed these lights. Demonstrations are available in the district for both 250-watt and 400-watt equipment. The quality of the new lights is shown to be of distinct advantage, especially in picking operations.

The group was emphatic in generally encouraging better lighting in mines and tipples. The best lighting available should be installed inside, outside, and all over the mines. Slides were presented in Mr. Altree's talk to show many places where light is needed underground. Eighty-three percent of the mine employes work underground—they too should have the best possible illumination. Rock-dusting and whitewash have aided illumination in many places, helping the men in their work and in traveling from place to place. Mechanical loading, bringing power to the face, has aided the lighting problem, too. In short, all places in need of light can now be better and more safely illuminated with explosion-proof models of highly efficient lamps.

In addition to the program shown herewith, introductory remarks were made at a luncheon by G. L. Furr, division manager of the power company; J. P. Gills, assistant manager; Julius Hall, power engineer; and J. C. Smith, Jr., illuminating engineer. Response for the operators came from William E. McQuail, operating and safety committee, and R. B. Williamson, marketing committee.

PROGRAM

Bluefield, W. Va., December 9, 1944

Lighting Aids for Marketable Coal

Opening Remarks—W. E. McQuail, Chairman, Turkey Gap Coal & Coke Co.

The Power Companies' Purpose—Julius Hall, Jr., Division Power Engr., A. E. P. Co.

Lighting Aids for Marketable Coal—E. D. Altree, Illuminating Engr., General Electric Co., Pittsburgh, Pa.

Demonstration, A. E. P. Co. Service Building, E. D. Altree and J. C. Smith, Jr.

Round Table Discussion, W. E. E. Koepler, Leader, Secy., Pocahontas Operators Assn.

Concluding Remarks and Adjournment—J. C. Smith, Jr., Illuminating Engr., A. E. P. Co.

Ultraviolet Light

(*Continued from page* 27)

greens. Uranophane, uranospathite, dakeite, and uranium phosphates are invariably fluorescent. The nonluminescent uranium minerals include the silicates and uranium micas of composition $M_2(UO_2)_2(XO_4)_2 \cdot nH_2O$, where M may be copper, iron, lead, bismuth, manganese or uranium dioxide, X may be arsenic, phosphorus, vanadium or sulfur, and n may be from 8 to 12.

Petroleum Exploration Helped Greatly

All petroleum oils are believed to fluoresce after their recovery and before any refining. The slightest trace of oil will fluoresce, even after dilution with large amounts of mud or water, or if dispersed in very small amounts throughout shale, friable earth, or in cuttings and cores. Petroleum usually fluoresces a bright blue or blue-green color, but a variety of hues, depending upon the locality, have been observed.

Experience proves that an ultraviolet is one of the finest and most valuable field instruments a geologist can have. In one field in Louisiana the Mineralight was employed on six wells: it gave correct results on about 50 cores containing six or more gas-oil or oil-water contacts. The fluorochemical exploration of petroleum, as the branch of luminescence science is known when it pertains to petroleum work, is an extensive and specialized subject and has been recently discussed in a bulletin by the present writer (see bibliography).

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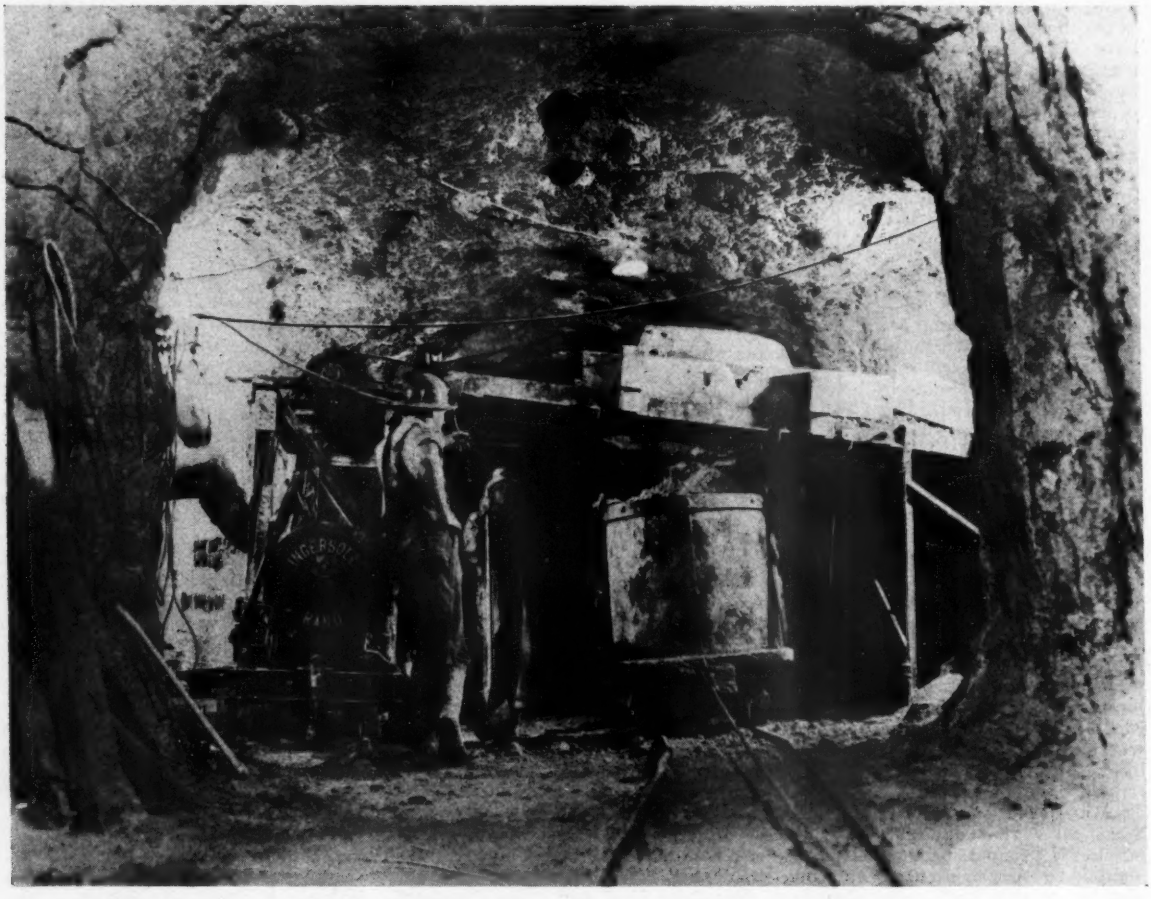
Slushing Adapted To Bauxite Mining



A 3-drum 30 horsepower hoist hauls the scraper over the loading ramp

Problems of Maximum Pillar Recovery and Labor Shortages Have Been Met Through Application of Slushing

By JULIAN A. FULLER
Crouch Mining Company, Inc.
Bauxite, Ark.

BAUXITE is now being both successfully and economically mined by slushing in Saline County, Ark., marking the first instance of the use of such methods in the bauxite field. The company employing it is the Crouch Mining Co., Inc., which operates one of the deepest mines in the field.

The introduction of scraping to bauxite resulted chiefly from the following two factors.

1. Present wartime inexperienced labor was not only being paid more per hour but was also producing less tonnage per man than formerly.
2. Difficulty in obtaining labor of any classification or experience.

General Mining Problems

The flat-lying but undulating ore body, approximately 300 ft. deep and averaging 13 ft. thick, is of exceptionally high grade material. The deposit is overlain by strata of lignite, clay, and approximately 200 ft. of quicksand, the latter presenting many complications to routine shaft sinking methods. However, by means of a clay seal rotary-hydraulic process, an 84-in. diameter hole was drilled and a 74-in. casing ½ in. thick was "floated" down in 20-ft. sections and liquid cement pumped around the shaft.

The mine was developed on a 45-50 ft. square-centre basis. The drifts and crosscuts are 11-12 ft. wide and 6-8 ft. high, leaving pillars 39-44 ft. thick.

With hand mucking and on the "retreat" the pillars are split through from two or four sides, leaving four small pillars at the corners of the primary one. This method, although

successful, limited the recovery and endangered the men.

Scrapers Introduced

In the scraping operation now installed the pillar sides are shot to a depth of 4 ft. on each side of the drift. Sheaves of the 10-in. snap block type are hooked to slings which are in turn fastened to eye-bolts at the extreme crosscuts (see diagram).

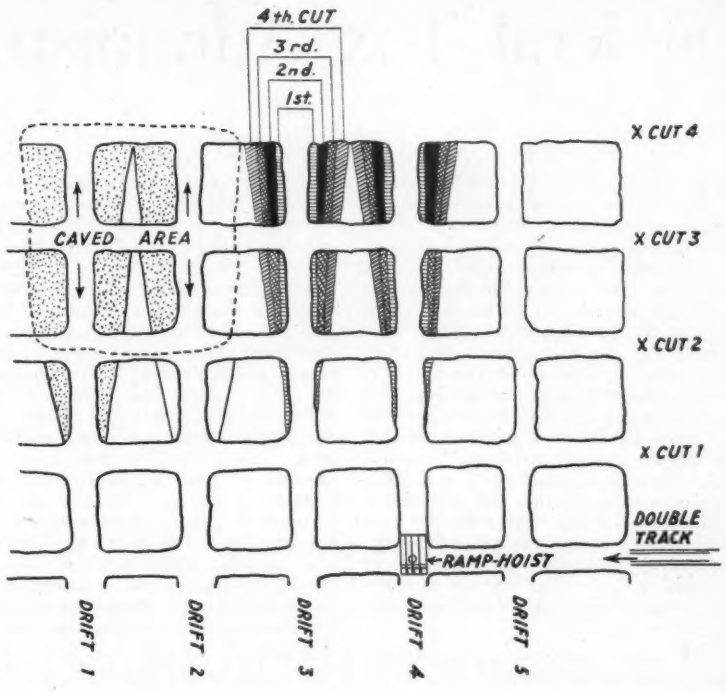
Light weight steel ramps with a 12-ft. slope length and a 5-ft. tail piece, 56 in. high and 52 in. wide are used. The ramps are bolted together in sections to facilitate erection and dismantling. Cans 36 x 30, 52 in. high from the rail pass under the ramp. Spillage is reduced to a minimum.

The 3-drum 30-h.p. NNN 3-C I.R. hoist is mounted on two separate trucks to accommodate the very sharp curves in the mine. The cables do not pull directly from the machine in the usual manner but rise vertically to run on three 12-in. rollers and then to the scraper bucket. The hoist frame is connected directly to the ramp by two eye and bolt sockets. This arrangement helps to cut down the overall height of the machine, and the heavy hoist is much steadier as it has a low centre of gravity.

A ½-yd. crescent bucket with teeth is used which permits the loading of a can in one operation. The bucket, 48 in. wide, clears the side boards of the ramp by 2 in. and slides on three 35-lb. rails which are bolted to the ramp.

The broken ore is then loaded into the cans, 14 cans comprising a train, and is pulled by cable and a stationary hoist to the main line for delivery to the shaft.

The pillars are shot again, the back pillars more than the front ones (see diagram 2nd, 3rd and 4th cut) and the loading is carried on until the operation is complete and complete caving occurs (see caved area).



Pillars are shot in progression. The back pillars are cut deeper than the front ones

The double tracked haulage way facilitates the changing from one drift to the next. An auxiliary ramp is erected whilst the other one is being used. Consequently a very rapid change of set-up is possible.

Scraping has made it possible to take out ore that men would be unable to get by hand mucking because of dangerous roof conditions, consequently a higher recovery is possible and danger to the personnel is greatly reduced. In the event of a sudden cave-in only the bucket and sheaves may be lost.

Over a four-month period the scraper has cut the cost per ton by 40 percent compared to present hand mucking. At the present time 55 percent of the ore is being mined with this machine and the company is considering the installation of another.

The 1½-yd. crescent scraper permits loading a can in one pass. Slide and tugger in background

Scraping makes it possible to get out ore that men would be unable to take by hand mucking because of unsafe roof conditions

Federal Tax Administration

By HENRY B. FERNALD
Loomis, Suffern and Fernald
New York

THIS subject of Federal Tax administration I shall consider as embracing all that is involved in giving us an administrable and well-administered tax system. This is much broader than asking whether Bureau officials have in all particulars given the best administration they could under the law and policies laid down for them, or whether improvements in administration might be made within the limits of present law and policies. It even goes beyond possible revision of purely administrative and procedural provisions of our laws, and leads us to consider whether the substantive provisions of the law—even the nature, the rates and the subject matter of our various taxes—need revision if we are to have what we can consider an administrable and well-administered tax system.

We can, I think, all agree on certain fundamental points:

(1) The Government is equally concerned with the taxpayers in having a tax system which can and will be equitably and efficiently administered to yield needed revenues.

(2) Any tax system which cannot be or is not equitably and efficiently administered will sooner or later break down and lose its productivity because of failure of the Government to collect the revenues which the tax system should produce, failure of taxpayers to engage in the transactions which will give the sources of revenue from which the taxes would be collectible, or rebellion of taxpayers against bureaucratic exactions. The power to tax still involves the power to destroy, and the tax system may work destruction of revenue even though that was not an intended or desired result. Unintelligent action may work as much damage as wilful intent.

(3) Admittedly, in an emergency and for a short period—particularly in war time—we may sustain tax laws and tax administration and have them effectively yield revenues not to be expected over an extended period.

We should recognize and pay tribute to the high standards of integrity and administrative ability which we have been fortunate to have in the Bureau. I think the Commissioner of Internal Revenue and his staff, including examining agents, have done as good an administrative job as we could expect under the conditions which have existed, the laws we have had and the administrative policies established. There have inevitably been weak points needing correction, but the Bureau has been doing excellent work under difficult conditions and within its limitations. As I shall indicate later, we have had laws not capable of good administration and policies laid down by the law or adopted by the Treasury which I believe wrong. The most able, honest and zealous administrative officials cannot give good tax administration under bad law or erroneous policies. We should make good administration possible.

A major trouble has been that we drifted rather blindly into a war situation, the implications and results of which we failed wisely to estimate or frankly to face. Then in a head-over-heels scramble we have enacted one revenue law after another; each defective and requiring retroactive amendments; each out of date before we got the revenues from it, or even before the Treasury regulations under it were issued. Naturally this has not given us a well-administered tax system. I am not trying to allocate blame for this to Congress, to the Treasury or to the taxpayers. Let us grant that we all share in this blame; those who failed to see or frankly to face the situation and those who seeing it failed to make effective protest; taxpayers as well as Congress and the Treasury. I am more concerned with correction for the future than with blame for the past.

We should do what we can to settle the wartime mess we have gotten into, but we should now be looking particularly toward long-term tax administration as it should follow for many years when we shall be trying to raise the amounts needed to meet Federal operating budgets and to pay the interest upon and gradually reduce a debt of some $300 billion.

To look at present faults will help to see what we should or should not do to have an administrable and well-administered long-term tax system; and recognition of what needs to be done for the future will help us to see what might be done to meet the present emergency deficiencies. So I shall mention some of the particular faults I see, to which each of you can add or for which you can substitute others if you wish.

An Examination of Present Faults Will Help Us to See What We Should or Should Not Do to Have an Administrable and Well-Administered Long-Term Tax System

Incomprehensible Tax Laws

Our recent tax laws have not been capable of good administration because they have been so largely incomprehensible to taxpayers and Government representatives. From time to time over the next 10 or 20 years the Supreme Court will give its final interpretations; but meanwhile taxpayers, tax counsel, Treasury and Bureau officials and employes are working in a maze of uncertainties. The phraseology and sentence structure of the law, the complicated nature of its provisions, its arbitrary formulae, its unnatural or inadequate definitions, its exceptions, limitations and qualifications are beyond the ability or opportunity of taxpayers and of Government representatives to grasp and carry in their minds. A single law with these defects would be bad enough, but we have been making changes every year, not merely as to the law applicable to succeeding years

Presented at the 1944 meeting of National Tax Association, St. Louis, Mo.

AMERICAN CYANAMID COMPANY

announces the applicability of

HEAVY-MEDIA SEPARATION (SINK-FLOAT)

to Surface Coal Preparation

Many years of operation on a wide variety of materials has conclusively demonstrated these positive advantages of Heavy-Media Separation:

1. **Cleans at any pre-determined specific gravity from 1.25 to 3.4 in a closed circuit without effluent problems.**
2. **Continuously maintains the pre-selected specific gravity within plus or minus .01**
3. **Plant can be designed to make as many specific-gravity fractions as may be desired.**
4. **The specific gravity can be changed at any time and in a few minutes.**
5. **Uses low-cost medium, with a negligible loss.**
6. **Treats full size-range without pre-sizing.**
7. **Plant can be started and shut down without bank loss of clean coal or loss of operating efficiency.**
8. **Since the medium can be completely recovered from fine coal present in the circuit, loss of coal and medium due to inefficient pre-sizing caused by variable moisture in the raw coal feed is no longer a serious consideration.**

AMERICAN CYANAMID COMPANY *30 Rockefeller Plaza, New York 20, N.Y.*

APPLICATIONS of HEAVY-MEDIA SEPARATION PROCESSES offered by CYANAMID

Of the efficiency of a true sink and float method in separating clean coal from refuse, there can be no question. The industry has long sought a way to make accurate separation of all sizes at a pre-determined point on the washability curve at low cost.

Heavy-Media Separation Processes have produced these results as demonstrated on millions of tons of metallic and non-metallic ores, and by the ever growing number and diversity of new Heavy-Media Separation plants. Their economic extension to coal cleaning has been completely confirmed by extensive continuous unit operation on a variety of raw coals requiring separations at gravities ranging from as low as 1.25 to as high as 2.00. No other coal cleaning process or combination of processes can operate throughout this wide range.

In the Heavy-Media Separation Processes a water suspension of a low-cost magnetite medium is maintained at a pre-selected gravity by continuous reclamation of the medium carried off by both sink and float products. The medium, which is washed from the separated coal and refuse, is magnetized, thickened, magnetically separated from waste, densified, demagnetized and returned to the circuit.

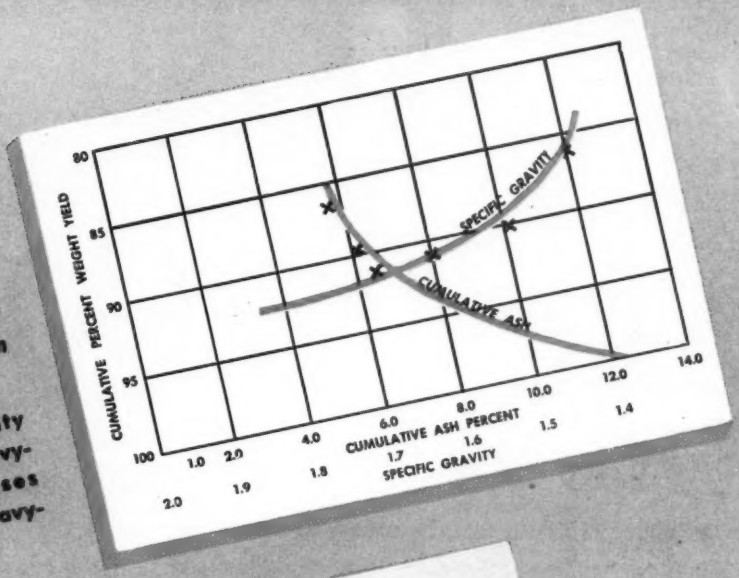
As shown in the accompanying diagram, these operations are performed automatically in standardized and proven equipment. The plant can operate around the clock at a pre-determined gravity. Furthermore, the flexibility of control is such that the operating gravity can be changed at will and in just a few minutes. The plant can be shut down and restarted without loss of coal or medium. No technical knowledge or extensive experience is required of the operating personnel.

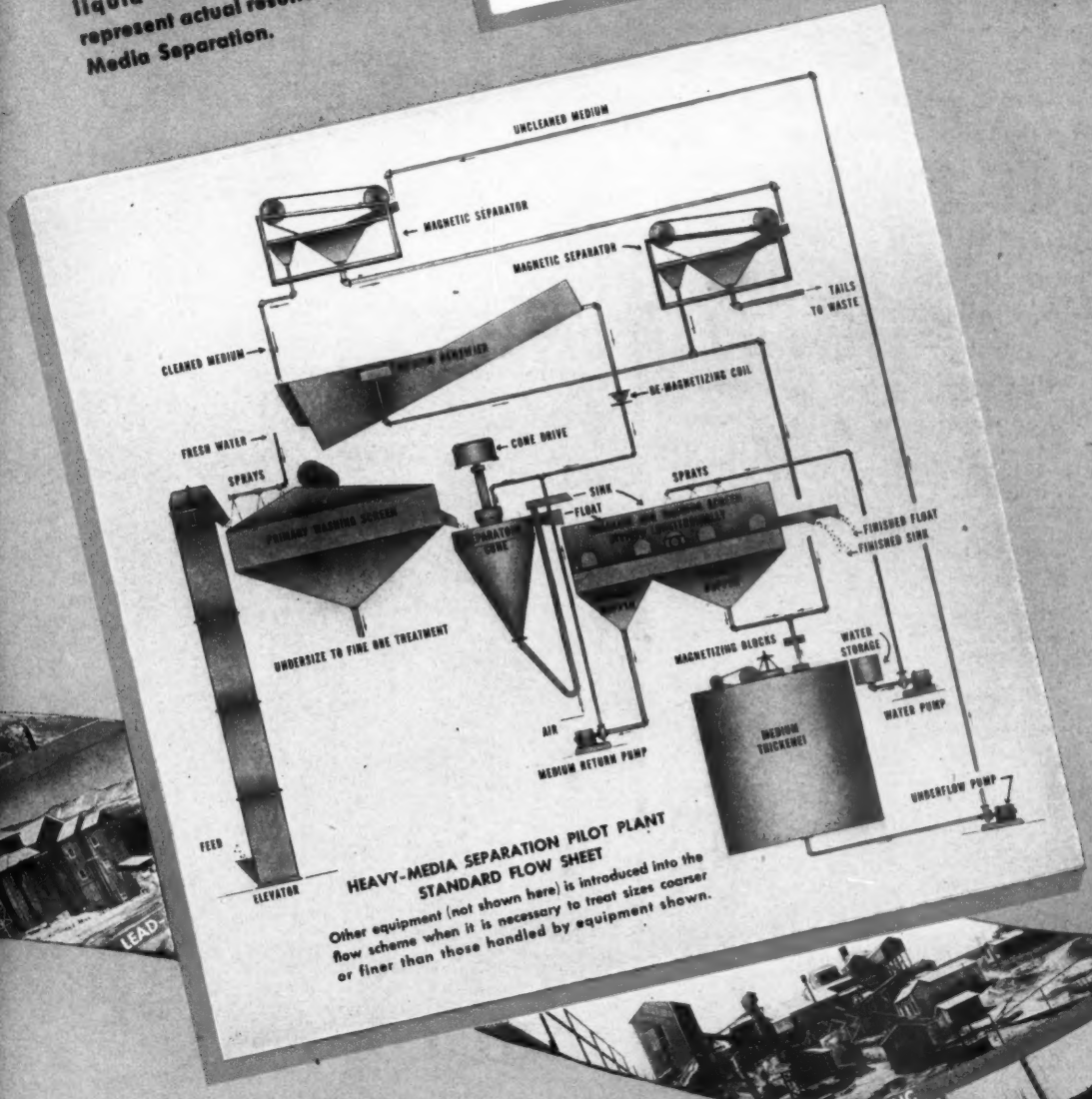
The separatory vessel may be a cone or of other suitable shape, but whatever the type of separatory vessel the principles of operation and overall efficiency of cleaning are identical.

AMERICAN CYANAMID COMPANY

Example of Separating Efficiency of Heavy-Media Separation on Bituminous Coal.

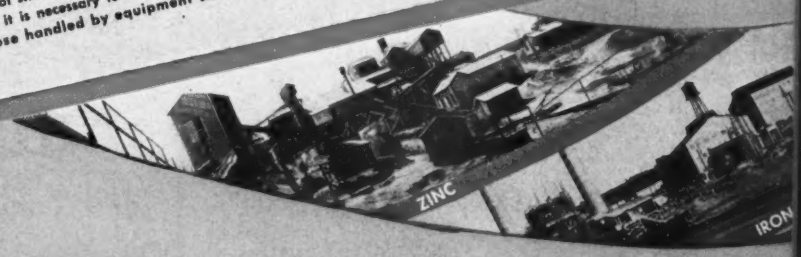
Curves represent washability characteristics based on heavy-liquid studies. The crosses represent actual results by Heavy-Media Separation.



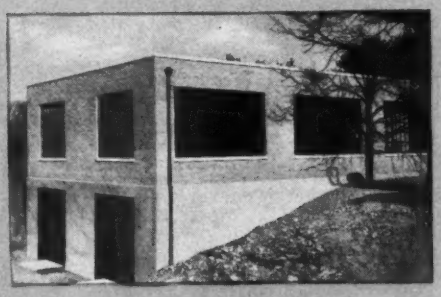


HEAVY-MEDIA SEPARATION PILOT PLANT
STANDARD FLOW SHEET

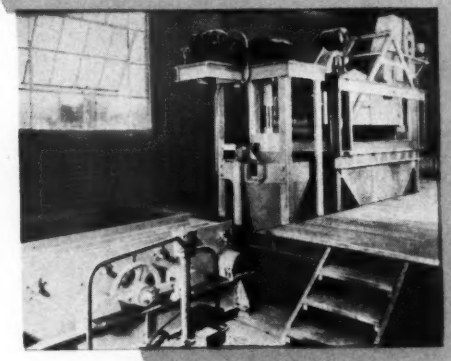
Other equipment (not shown here) is introduced into the flow scheme when it is necessary to treat sizes coarser or finer than those handled by equipment shown.



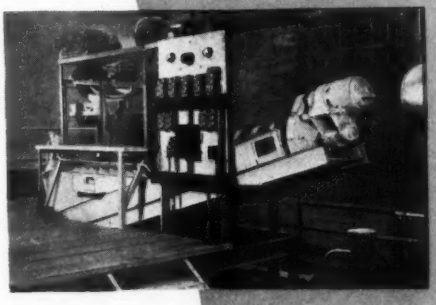
30 Rockefeller Plaza, New York 20, N. Y.



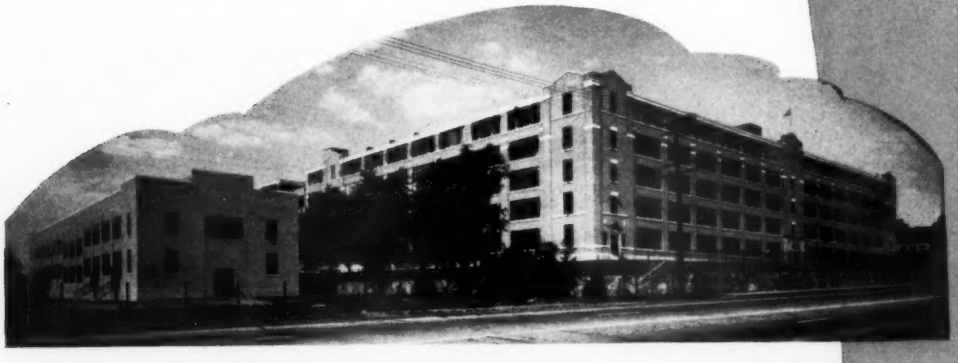
CYANAMID
TESTING and TECHNICAL SERVICE



At its Stamford Research Laboratory, Cyanamid is prepared to run continuous tests on carload lots of your coal on commercial-size equipment having a capacity of five tons per hour. Cyanamid is prepared also to contribute its experience gained in the diversified applications of Heavy-Media Separation to assist in developing a flow scheme best suited to individual requirements, and to assist in the design and operation of plants.



American Cyanamid Company will be pleased to receive inquiries from coal mining companies or contracting engineers of their selection, as well as others interested in coal preparation.



AMERICAN CYANAMID COMPANY

30 Rockefeller Plaza, New York 20, N. Y.

but also retroactive for the past. There is no ready way to know what are the provisions of law or regulations applicable to 1941; only a careful study of elaborate indexes and subsequent amendments and Treasury decisions will disclose this. Both the Government and taxpayers have recognized that much amendment was necessary to meet defects, and now we are planning how we may remedy other defects which still exist.

That the Treasury and Bureau do not pretend to understand the law, is admitted by the frequency of decisions retroactively amending the regulations, by the reversal or modification of prior opinions and decisions, by the Government's questioning in court its own regulations and published decisions, by the Bureau's use of a mass of secret rulings and opinions which it is unwilling to furnish even to taxpayers whose cases are in question or to taxpayers to whose cases they are applied.

We should recognize that it is impossible for the Bureau to obtain the great number of internal revenue examining agents and other employes needed who will have either the ability, the experience or the time to understand the practical application of the many involved provisions of the law and regulations, or to keep track of the new rulings and decisions continually being issued. We seem to have made no serious endeavor to write tax laws which the average of Government employes or of taxpayers could understand. The Bureau has probably done as good a job as could be done in providing reviewers and specialists to assist a force of examining agents who are as able and well-trained as I think we could hope for under existing conditions. How many can understand Section 722, or Supplement C, or Section 115 (l) and (m) or others we might mention?

Taxpayers are simply in a fog of doubt as to their past liabilities and quite unable to estimate the probable tax consequences of current or future transactions.

In dealing with subordinates it is poor administration to issue instructions which cannot be understood by those who are to comply with them. Similarly, to have a well-administered tax system the tax law should be intelligible to those who enact it, to those who are to administer it and to those who are to pay the taxes it imposes.

In enacting our tax laws we have given too little attention to administrative aspects. I think we have failed to take advantage of the administrative wisdom which exists within the Bureau. Whether the fault lies with Congress or with the policy-making officials of the Treasury, the result has been unfortunate. For example, we could have foreseen in 1941 and 1942 the administrative problems involved in broadening the individual income tax base and so have avoided the muddle which we have been trying to straighten out in 1944 and hope to have in fairly satisfactory shape by 1945. The millions of tax returns in default for 1942 was to be expected in trying to impose the tax on vast numbers who had always understood that the income tax should not apply to them and who had never expected to accumulate the funds to enable them to make the required tax payments. Because we had not made provisions we later recognized had to be made for withholding at source, the defaults which occurred threatened our entire income tax system, and breakdown was only avoided by forgiveness. The complaint in 1943 of complexity of the tax forms was not the fault of the forms for the lower income tax returns, which were about the best which could be drafted, but the fault was in the complexities of the law, as well foreseeable when the law was enacted as when revisions were made in 1944.

Let me make these particular suggestions:

(1) Have a firm determination that tax laws shall be written in language and in sentence structure which shall be understandable by those who must comply with the law.

(2) Make the plan of taxation such that taxpayers can grasp it. To this end the applicable principles should be stated rather than arbitrary formulae which conform to no stated principles. To the extent that formulae are required or desirable, have the formulae follow and supplement and be in accord with principles stated.

High Rates on Uncertain Income

One fundamental trouble may be that we are trying to impose too high tax rates on that intangible, immaterial, undefined idea we refer to as net income. Salary, interest or dividend receipts may be identifiable, but business income (gross or net) does not represent actual receipts or anything else tangible or material; it is merely the theoretical result of innumerable computations. When rates were low enough so that margins of error in determining the theoretical net income amount were not material either to the taxpayer or to the Government, we did not have to be greatly disturbed about this point. At low tax rates we were not greatly disturbed because we defined "gross income" as including "gains or profits and income derived from any source whatever." This becomes very disturbing at high tax rates when the margin of error in making determinations or defining the concept may approach or exceed the supposed margin left to the taxpayer. It is also serious under heavily graduated tax rates when the particular year to which income or deductions are ascribed may make a vast difference in the tax payable. An important question is whether we may not be asking our income tax system to bear a load which it should never be expected to carry and which in itself will prevent us having an equitable and well-administered and even productive tax system.

Lack of Stability of Law

There should be reasonable stability in our tax laws. We cannot hope for good administration if we are continually changing their substantive provisions. It is bad enough for Government employes, it is impossible for taxpayers, to keep abreast of a series of continually changing standards of what constitutes net income with all its permutations for various purposes of the law—"adjusted net income," "normal-tax net income," "surtax net income," etc.; and now "adjusted gross income." We cannot avoid changes from time to time as changes are manifestly necessary to give an equitable law, but in formulating our law for post-war taxation we should definitely aim for a law which we can reasonably expect will stand for years without material amendment in its substantive provisions.

This is not merely a matter of administration, but also of tax yield. Uncertainty as to the future taxation is a definite deterrent to investment and business development on which our future revenues depend. It is the net amount after taxes which is the business or investment profit. Uncertainty of what the Government will take in taxes or what allowance it will make for losses, increases the risk, and may lead to the conclusion that the probable net profit is not sufficient incentive to warrant that and other risks involved.

Doubts and Burden of Proof

The old doctrine of taxation was that doubts should be resolved in favor of the taxpayer. Today the Government does not hesitate to urge that all doubts should be resolved in favor of the Government. If a taxpayer tries in the courts to overturn or modify a determination made by the Commissioner, the law places on him the burden of proof. We know that the Commissioner's representatives have not hesitated to urge in court that all doubts should be resolved in favor of the Government, and we find that some in the Bureau feel this same standard should apply to their own determinations.

Any such standard tends to bureaucracy and is a temptation to try to get law stated in doubtful and uncertain terms, leaving a greater field of uncertainty within which doubts may be resolved against the taxpayers. I think we should return to the old principle that taxation should be determined only under clear mandate of law, with doubts resolved in favor of the taxpayer, thus placing on the Government itself a responsibility to get the clearness and definiteness of law which is necessary for a well-administered tax system.

The British avoid a tendency to bureaucracy by their boards of local commissioners, not Bureau employes, to whom the taxpayer can appeal. So Bureau officials know their decisions must be such as will appeal to the practical judgment of representative citizens of the communities. Relatively few appeals are ever carried to the courts. I know the British, by not taxing capital gains, avoid a multitude of technicalities we have which may make their system of local boards inapplicable here, but I think we need more of their thought of the importance of recognizing and safeguarding the rights of the taxpayers.

After all, taxpayers are very essential and must be cherished and preserved, for without them our whole tax system will fail.

Our Bureau tries to deal in utmost courtesy with taxpayers, giving them by courtesy much more than the law requires. Even furnishing taxpayers copies of revenue agents' reports is simply a courtesy, to which the taxpayer has no legal right. Of course, there should be courtesy, but this does not take the place of legal rights. Much of the question of a taxpayer's legal rights seems to me to rest on the burden of proof which he must bear, and how doubts are to be resolved.

Refunds

The present policies with respect to refunds I think are a distinct menace to our tax system. If the taxpayer has overpaid his tax and asks that the overpayment be refunded to him he is met with the greatest difficulties. He is compelled to sustain a burden of proof far greater than that with which he is faced where a deficiency is being determined. If he establishes the error in his tax return which is the basis for his refund claim, a definite attempt is made to review and reconsider other previously-determined items in the return in an endeavor to find possible offsets. The result is that taxpayers have been made to feel that the Government looks at an overpayment of tax as being a most serious error so the taxpayer should, if possible, avoid any overpayments. I think we should reestablish the principle which the late Commissioner Roper in his day had followed—that the Government should be just as ready to refund an overpayment as it was zealous to collect deficiencies.

Instability of Rulings and Decisions

Confidence in our tax system is considerably undermined by lack of confidence in Treasury regulations and rulings. Any regulation, ruling or decision is subject to being overturned or amended with retroactive effect at any time. The special advance closing agreement does give the taxpayer protection but this is only conclusive as to the particular case covered by the agreement. Such closing agreements are not easy to get. There is a natural reluctance of the Treasury to give these without exhaustive statement of the case and its careful review and, of course, there must be some limitation on the number of closing agreements that the Treasury can try to pass through in a limited time. I think the closing agreement is essential and should be continued. However, it does not meet the situation of the person who carefully studies the Treasury regulations and opinions, trying to determine the probable tax status of a past or prospective matter only to find that the rulings and opinions of Government officials on which he relied have been amended retroactively before his case is settled. There is a considerable feeling among taxpayers and tax practitioners that the Commissioner should have authority to and be willing to settle tax issues on a basis of the regulations and rulings effective when the transactions occurred.

There is similar criticism of the Commissioner's unwillingness to acquiesce in or abide by decisions of the tax court or other courts in cases where the Government has not taken appeal. I know there is much to be said on this point, but I believe the criticism is serious enough to merit careful consideration.

Planning for the Future

We need to face very frankly and seriously the administrative problems involved in trying to raise the revenues we shall require for many years to come.

INDIVIDUAL NET INCOMES FOR 1942
(Including Taxable Fiduciary Income)

AMOUNTS ABOVE CERTAIN STATED INCOME LEVELS

The treasury Statistics of Income for 1942, preliminary (June 26, 1944) show individual and taxable fiduciary net incomes reported on tax returns grouped into certain stated income classes. Analyzing these,* the amounts of net income (before personal exemptions and dependents' credit) which will be above certain stated income levels shows as follows:

Net income for the year	Millions
Exceeding $100,000	$ 559
Between $50,000 and $100,000	623
Exceeding $50,000	$ 1,182
Between $25,000 and $50,000	1,185
Exceeding $25,000	$ 2,367
Between $10,000 and $25,000	2,739
Exceeding $10,000	$ 5,106
Between $5,000 and $10,000	3,388
Exceeding $5,000	$ 8,494
Under $5,000:	
Taxable returns	59,694
Nontaxable returns	11,835
Total net income per tax returns	$ 80,023
Personal exemptions and credits for dependents applied	41,566
Total taxable net income	$ 38,457
National income payments for 1942 (Department of Commerce)	$115,000

* This analysis looks at that part of the net income of the taxpayers in the higher brackets which will fall within each of the groups. For example: Of $1,188 million total net incomes of those who have net incomes exceeding $100,000 per year, only $559 million will be income in excess of $100,000 per year each, $90 million will be that part of their net incomes not exceeding $5,000 per year each, another $30 million will be the part between $5,000 and $10,000, etc.

For 1942 personal exemptions were $1,200 for married status, $600 if single; with credits for dependents $350 for each (except one).

Bureau of Internal Revenue, Washington, D. C.

In spite of all our errors and lack of intelligent planning we are managing to get through the war emergency because it is a war emergency.

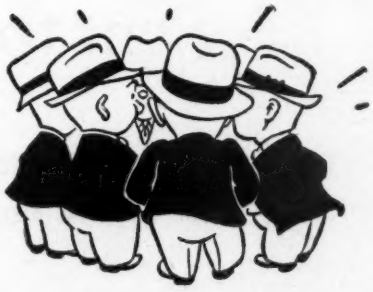
We have been satisfied to meet only part of our current expenditures from current revenues and to meet the balance by borrowing.

We have not hesitated in the emergency to place on business enterprise and investment a tax load which would kill incentive for risk investment. We could do this in the emergency on the ground that we did not want new investment in non-essential industry, and that the Government was prepared to meet or to support investment for war essential enterprises. There was the appeal to patriotism. There was expectation of change when the emergency had passed.

Much of our tax revenues have been only a partial recoupment of what the Government itself was spending.

We cannot in any such ways create an adequate, productive, well-administered, long-term tax system. We must face the different conditions and problems of the long-term future. We must fairly estimate our revenue requirements, the sources from which those can be met and the practical results of proposed tax plans. We have not time here to discuss this at length, but let me briefly illustrate what I mean.

For 1942, national income payments (Department of Commerce estimates) were $115 billion, but an analysis of preliminary Treasury Statistics of Income (hereto attached) shows the entire amount of individual net incomes above the $25,000 a year amount was less than $2½ billion (without allowance for personal exemptions); about 2 percent of national income payments; not half the amount of interest on a $300 billion national debt; a minor amount compared with possible $18 or $20 billion annual budgets. The entire amount of individual net incomes above the $5,000 a year amount was for 1942 only $8½ billion; 7½ percent of national income payments. The reported net incomes below the $5,000 a year amount were $71½ billion.



What corresponding figures may be over a long term of future years will depend on many things—employment and business activity, inflation, and the nature and rates of taxes themselves. If we could expect similar incomes in post-war years, we know that if we tried to take through taxes the entire $2½ billion over $25,000 a year, or the entire $8½ billion over $5,000 a year, those amounts would dwindle and disappear as there ceased to be any inducement to have incomes which fell into the 100 percent bracket. Can we impose a 60 percent, 70 percent or 80 percent rate and still have taxpayers feel there remains incentive for the effort and risk to obtain such incomes? If high rates kill incentive, the Government will lose taxes it might have obtained, and we must face the consequences of lack of production and employment if investments are not made. To the extent we lose tax on higher incomes we must expect a greater load, directly or indirectly, on lower incomes.

If, as some suggest, taxes on corporations are eliminated, increased dividends would increase the amount of individual net incomes, and, without passing the point of productivity, a higher individual tax could be imposed on dividends than if the individual tax were on top of a corporate tax. But, however the taxes are imposed, the one tax or the combined taxes must be such as will not impair seriously the incentive for investment.

We must likewise consider sales and excise and other taxes, each with its particular problems and possible results.

Is this problem of wisely planning a tax system rightly to be considered a problem of tax administration? I do not know. But we know that unless problems such as these are faced frankly by Congress, by the Treasury and by taxpayers, and are wisely dealt with in laws reasonably comprehensible by those who are to determine and by those who are to pay the taxes, we cannot hope to have a tax system productive and well-administered.

At the scene of this mine disaster in West Virginia nearly twenty years ago the safety car became the headquarters and center of surface activity for rescue and recovery staff

Veteran Mine Safety Car Sent to Alaska

The Colorful Pages of Mine Rescue History Have Made Frequent Reference to the Bureau of Mines Safety Cars

MINE Safety Car No. 5, a specially designed railroad coach and a veteran of many heroic rescue missions to coal and metal mine disasters in the United States during more than 28 years of service with the Federal Bureau of Mines, has been assigned to the Territory of Alaska to help in the Bureau's mine safety program in that area, according to Secretary of the Interior Harold L. Ickes.

One of the first of three all-steel safety cars placed in service in 1917, Car No. 5 was sent by rail and water transport last month from its headquarters in Pittsburgh, Pa., to Anchorage, Alaska, to operate in coal fields and mines served by the Alaska Railroad, which connects the open harbor of Anchorage with Fairbanks in the interior.

Although constantly held in readiness to lend assistance at mine fires and explosions where human life is endangered, the fully-equipped mine safety cars also perform an important function in the mine-rescue, first-aid training, and accident-prevention program of the Bureau, and it is in this latter work that Car No. 5 will be used chiefly in Alaska, Bureau officials reported.

Mine safety cars have had a colorful history dating back to the first year of the Bureau, in 1910. The first annual report of the first director of the Bureau, Joseph A. Holmes, one of the pioneers in mine safety work, noted that seven wooden railroad cars then were in service at strategic locations in various parts of the United States.

In the intervening years the cars have traveled over thousands of miles of American railroads (and one car was sent into Canada) to assist in rescue and recovery operations after disasters. The wooden cars, which were the old-type Wagner sleeping cars adapted for Bureau use, gradually were replaced with the present modern all-steel cars.

Cars Designed to Give Quickest Possible Service in Emergencies

Each safety car carried complete mine-rescue and training equipment, including self-contained oxygen breathing apparatus, electrically-driven oxygen pumps for charging apparatus, a number of cylinders of

oxygen, all-service gas masks and spare canisters, oxygen inhalers for use in artificial respiration, stretchers, permissible flame safety lamps for gas-testing purposes, permissible electric cap lamps for portable illumination, and many other special devices.

Since the full crews of experienced safety experts lived aboard the cars while traveling from mine to mine conducting first-aid, mine-rescue, and mine accident-prevention courses or when assisting at mine disasters, each car was outfitted with necessary household fixtures, sleeping accommodations, kitchen equipment, and its own electrical plant to provide operating current. One section of the car served as a demonstration room for the various classes.

Speed was essential in the early days of the mine safety cars because only a few of the larger mining companies maintained mine-rescue stations, and self-contained oxygen breathing apparatus and all-service gas masks were vital to the saving of lives of men entrapped by mine fires and explosions.

Recognizing this urgency, railroads frequently furnished a special locomotive for transporting the safety cars and in many instances gave the safety cars the right of way over all other railroad traffic.

Car No. 5, now refitted for Alaskan service, holds many exciting memories for some of the present Bureau of Mines safety officials, most of whom at one time or another served as crew members on the safety cars. The history of Car No. 5, as well as all of the other safety cars of the Bureau, demonstrates the courage and skill of the crew members in performing their hazardous duties after a mine fire or explosion.

The North Butte Fire Initiated Number 5

Long remembered has been the "maiden" rescue mission of Car No. 5, which a few weeks after being placed in service in the western states, was rushed to the scene of this Nation's greatest metal mine holocaust, the Granite Mountain shaft fire of the North Butte Mining Company, at Butte, Mont., which broke out shortly before midnight on June 8, 1917, and took a toll of 163 lives.

At the time of the fire 410 men were employed in the extensive underground workings, but 247 eventually escaped the suffocating fumes and deadly gases, 25 of them after being trapped for 36 hours and 6 more after being imprisoned for nearly 60 hours. Many of those rescued in the trying hours following the outbreak of the fire owed their lives to the expedient action of rescue crews wearing oxygen breathing apparatus in assisting the almost exhausted men to fresh air and in the prompt application of artificial respiration on the surface.

Daniel Harrington, now chief of the Bureau's Health and Safety Branch, then a safety engineer, arrived at the mine soon after the fire started, and even before the recovery operations were organized fully, two mine safety cars—No. 2, from Colorado Springs, and No. 5, from Red Lodge, Mont.—were speeding to the scene.

Car No. 5, completing a record run with a special locomotive over the Northern Pacific Lines, arrived within 12 hours after receiving the summons

Planning the rescue by studying the mine map. In this view Dan Harrington, now Chief of Health and Safety Branch, U. S. Bureau of Mines, is fourth from left. J. J. Forbes, Chief Mineral Production Security Division, is third from left

Oxygen breathing apparatus, permissible electric cap lamps, flashlights, self-rescuers, etc., are carried in the equipment of the car. This rescue crew is preparing for a trip underground

With a definite plan prepared, the crew leaves the safety car fully equipped for the hazardous rescue and recovery operation

to join the experienced mine-rescue crews of the North Butte Mining Company and other mining interests in the Butte district. Car No. 2 arrived early the following day carrying considerable additional much-needed equipment for recovery work.

Eight Long Days

For eight days recovery operations proceeded in the Granite Mountain mine, which then was the second largest mining property in the famed Butte district, covering more than 220 acres. More than 175 rescue workers wore self-contained breathing apparatus during the 8 days, and more than half of these men had been trained by the Bureau.

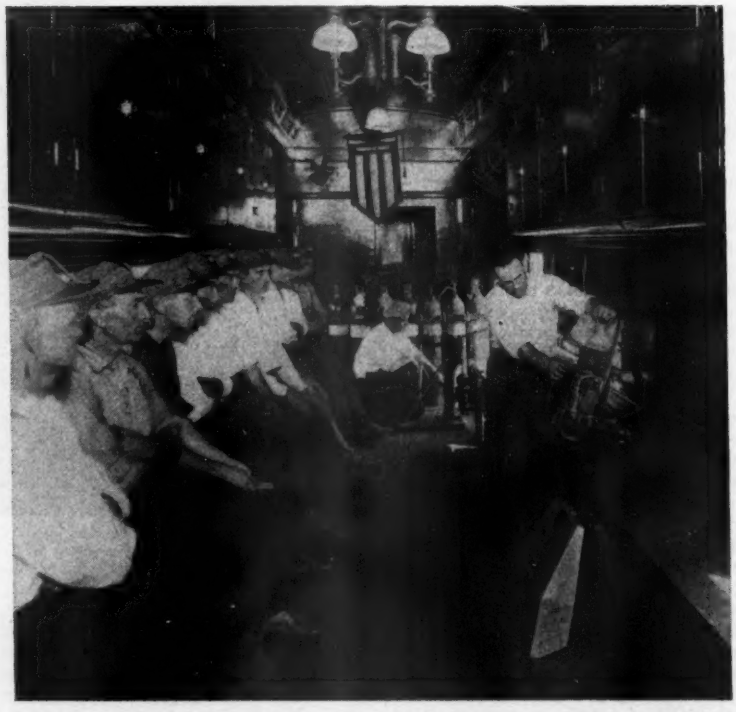
Rescue equipment was in almost constant use and the task of the men on the surface supervising and testing apparatus proved to be equally as important as that of the underground crews. J. J. Forbes, now chief of the Bureau's Mineral Production Security Division, was assistant mining engineer aboard Car No. 5, and in addition to assisting in the direction of underground recovery operations, alternated in supervising the maintenance of equipment with J. L. Boardman, then in charge of first-aid and mine-rescue work for the Anaconda Copper Mining Company.

Throughout the long and arduous task of exploring miles of gas-filled drifts and crosscuts, smoke-laden stopes, raises, and manyways, recovering bodies, and sealing still-burning portions of the mine, Butte district rescue crews and Bureau employes worked heroically side by side with utter disregard for their personal safety. During the entire eight days, not a single rescue worker's life was sacrificed and relatively few were overcome, although much of the work was performed in hazardous atmospheres.

Following this initial "baptism of fire," Car No. 5 continued to serve efficiently in the western states, traveling extensively in Montana, Wyoming, Colorado, Washington, Idaho, and Oregon, until the spring of 1921, when the car was transferred to the Alabama district with headquarters at Birmingham.

Dr. Sayers Joins the Number 5 Crew

A few weeks after the North Butte fire, Car No. 5 crew members "welcomed aboard" a new surgeon from the Public Health Service, which at



The safety car provides excellent facilities for training in mine rescue and first aid

that time provided medical attaches to assist the Bureau. The new surgeon joining the car in August, 1917, was Dr. R. R. Sayers, now Director of the Bureau of Mines.

Dr. Sayers long had been interested in silicosis hazards of coal and metal mines and in the effects of noxious gases on the human body, and he compiled invaluable data on these subjects while serving as surgeon on the mine safety cars. Many of these early studies, published individually and in collaboration with others, since have been recognized as important factors in maintaining health and efficiency in the mineral industries and are used widely by mining and affiliated companies of the nation today.

From Alabama, Car No. 5 was moved to the eastern Kentucky fields, being stationed at Pineville for several years before being transferred to Powellton, W. Va., for extensive research on dust hazards and corrective measures to curb these dangers.

Returned to Pittsburgh, Pa., a number of years ago, Car No. 5 has been kept constantly "in shape to move," but has been maintained largely as a training ground for new Bureau safety employes and to be used as an emergency car when other safety cars were called from their regular headquarters to assist at mine disasters.

Since its inception, first-aid, mine-rescue, and accident prevention have been some of the main safety activities of the Bureau of Mines. Because only a few men were qualified to teach mine-rescue procedures, virtually all of the instruction in this work was done by Bureau personnel for nearly 20 years.

Increasing demands by mining companies for the services of instructors prompted the Bureau to inaugurate special training classes for qualified personnel of mining companies who in turn were authorized to teach similar groups of mine workers. As a result of this cooperative mine-rescue training program, sufficient trained men are available in almost any mining region to care for mining catastrophes which may occur in that region. More than 17,000 first-aid instructors trained by the Bureau and distributed throughout the mining regions of the country are available to carry forward first-aid instructions.

While stressing the importance of accident prevention, Bureau safety experts nevertheless also have emphasized the need for preparedness to act in the case of disasters. This preparedness program has resulted in the training of more than 1,609,200 persons in first aid since 1910, and the instruction of more than 80,500 individuals in mine-rescue procedures. In doing this immense volume of safety educational work at mines, the mine safety cars have been of utmost assistance, and now Mine Safety Car No. 5, a pioneer of more than 27 years in the work in the United States, is to continue in Alaska.

Recaptured French Coal Mines Help Allies

THE recent recapture of the coal mines in France by the Allies has shortened the war in Europe by at least three months through the saving of Allied shipping space and stripping the Nazis of the urgently needed coal with which to make ammunition, armament, synthetic gasoline and oil, Louis Dupret, French coal expert and mining engineer, now in the United States, said recently at a reception given for him by the Bituminous Coal Institute at the Hotel Biltmore, New York.

The swift recapture of the northern coal mines of France prevented the Nazis from flooding them as planned and the quick rehabilitation of these mines has eliminated the need otherwise of importing 2,300,000 tons of coal during the last four months of 1944. This tonnage, he pointed out, would be the equivalent of the transportation and unloading of 30 complete armored divisions at the hard-pressed military ports of France.

The Nazis used upwards of 20,000,000 tons of coal a year from the French mines in the manufacture of their war supplies, which Mr. Dupret estimates could have been used by them in making the combined equivalent of over 500,000 robot bombs, 100,000 medium tanks, 100,000,000 3-in. shells and 4,000,000,000 hand grenades.

Coal was a major medium of exchange for the coal miner in the black market of France during the German occupancy, Mr. Dupret said, when the ration for French civilians was only 100 lbs. a month, in comparison to the Nazi's allotment of 1,500 lbs. to the coal miners each month to keep them healthy for their jobs, and they bartered much of what they were given and could abscond from the mines for food, clothing, and other commodities.

Hamilton Wright Photo.

LT. LOUIS DUPRET

Mr. Dupret was with his regiment in the Maginot Line when it was overrun and after his capture there was confined in Germany in five concentration camps and three jails, then assigned by the Nazis as a mining engineer on forced labor in the coal fields of northern France for 16 months before he escaped through Spain to North Africa, where he joined the French fighting colors again.

"All Allied eyes have turned often, of course, toward the great arsenal of America," Mr. Dupret said. "As a mining engineer I have appreciated personally the world record-breaking output of coal the United States has accomplished to make the vital weapons of war. I hesitate to contemplate what we would have done without this great American contribution in furnishing so much of the basic sinew for power and manufacturing of Allied needs.

"For more than four years the French coal-mining industry worked as a slave under the brutal German regime, and they suffered hunger, labored two and three Sundays a month, and shuddered at the frequent lists of hostages who had been shot.

"For these four long years they patiently watched the Allied air armada grow in power. In the familiar sound of the big bombers they heard the promise of liberation. Stubbornly they prepared themselves for that day. They protected their mines against the German vandals with axes and arms that had been hidden at the peril of their lives in order to turn the mines over intact to serve the Allies' cause.

"They are grateful for their liberation to the courageous American GI's, backed by the gigantic industrial capacity of this country. They know that the life-stream of this industry is the amazing coal production reached during the war and, in a feeling of solidarity, the gratitude of the entire French coal industry goes out to the many thousands of fellow workers in the American coal industry."

Coal Division, 10th Annual Conference

Progress of the Past Year is Reviewed and Plans for Future Activities are Discussed as All Committees Meet in General Session at Pittsburgh

OVER 200 coal mining executives, operating officials, engineers and manufacturers' representatives met at the tenth annual conference of the Coal Division of the American Mining Congress at the William Penn Hotel, Pittsburgh, on December 15. On the previous day the various committees held individual meetings to pave the way for the discussions to follow in general session. Results of the labors of these committees are reported beginning on page 50 of this issue.

Interest was high as the various committees reviewed their reports and outlined the new studies which they have in preparation. Major attention is being given to wartime operations, but considerable thought is also being directed toward post-war problems.

Julian D. Conover, secretary of the American Mining Congress, opened the conference at 10 a. m. with reference to the fact that the meeting represented something of a milestone as it was the tenth get-together of its kind. He paid tribute to the small group of enthusiastic and progressive coal men who, with Glenn Southward, started off the work of these committees in a meeting at State College, Pa., in the fall of 1935. He noted the close adherence to the primary purpose of working out improvements in coal mining methods and machines, developing more efficient and economical operating practices so as to produce more and better coal at lower cost with fewer accidents. He lauded the spirit of cooperation which has characterized the efforts of the Coal Division and noted the value of the whole effort to modernize our mines in the results which have been accomplished during the present war in getting out a record production in spite of seriously reduced manpower and other wartime handicaps.

The Luncheon

Conference delegates attending the luncheon heard talks by three well-known men in the coal mining industry—Harry Moses, president of H. C. Frick Coke Co. and chairman of the Coal Division of the American Mining Congress; Art Knoizen, director of the Mining Division of the War Production Board; and L. E. Young, consulting mining engineer of Pittsburgh. Mr. Moses welcomed the delegates to Pittsburgh and expressed his pride in the coal industry for the accomplishments of the past few years. "Despite the fact that we have been criticized because we didn't get production and despite dire predictions that we were going to freeze to death and the industries were going to shut down, somehow and some way, as we in the industry have always known it would be, we have kept American industry running and we haven't had people freezing to death."

He also noted that while post-war problems are tremendously important, industry must realize that there won't be any post-war problems until we get the war over. He expressed the wish that the coal industry would not take its eye off the ball in order to look at post-war plans to the extent that it might forget that we haven't won the war yet.

Mr. Knoizen praised the coal industry for the 100 percent cooperation the Mining Division of the War Production Board has had from every coal operator in the United States. "We have had to deny operators machinery, we have had to deny them repair parts, they have had others next to them granted machinery and repair parts, strictly on the basis of the justification for their equipment and the justification for the need of that coal, and we have had 100 percent cooperation from the manufacturers as a group, and it made it possible for us to keep you going to the extent we have." He noted that it would be difficult to name another industry in the United States that had been able to get a 35 percent increased production with a 10 percent drop in manpower. Announcing his resignation in mid-January he asked for a continuation of the splendid cooperation he has received from the industry for his successor.

L. E. Young, speaking of working with the British on their fuel supply problems, praised the splendid work the citizens of Britain are doing and reiterated the thought that our first job right now is to win the war. Dr. Young has had plenty of opportunity to see war-blasted Britain and was high in his praises of the way in which the British carry on.

He compared his recent visit to the mines of Britain with a visit in 1934. He noted that things that were considered preposterous in 1934 are now receiving very serious consideration. He recalled a recent public statement by Lloyd George before Parliament to the effect that there are 17 mines in which American-made coal machinery is in operation and eight more mines where American-designed machinery of British manufacture is in operation, and that mechanization plans have been made and approved for 42 more mines. This, of course, is the proving ground for the more than 1,000 mines in the British Isles. The problem of coal-mine mechanization is one of great importance at the moment in Great Britain.

Dr. Young posed several pertinent questions. He indicated the importance of the part coal would play in reparations and wondered what would become of the German coal tonnage that normally goes into the making of munitions when it will become surplus going into the competitive European markets. Noting that the coal fields of Europe which, in his opinion, are most likely to be mechanized are those of Upper Silesia, Poland and Czechoslovakia, all to be taken away from Germany, he was interested in what part this surplus coal would play in the competitive European markets. Also what part the British coal industry, with its subsidized conditions, will play in competition with other great European nations, like Russia for example. Lastly he wondered what part America would play from the standpoint of marketing coal.

Dinner Meeting Features Larry Allen

H. V. Brown, of Johnstown, Pa., chairman of the Manufacturers Division of the American Mining Con-

gress, spoke briefly before introducing the dinner speaker, Larry Allen. He praised the year of work done by the committee members and pointed out that the American Mining Congress could look back on this year as one of great accomplishment and stressed the fact that it is important to put greater efforts into this work with the confident expectation of greater dividends in post-war time.

In introducing Mr. Allen, Mr. Brown not only pointed to the thrillingly adventurous life of the world-famous Associated Press reporter, but also claimed him as a resident of several coal mining communities before going into international news gathering. Mr. Allen has been a resident of Charleston, W. Va., and spent a lot of his time in central Pennsylvania in his early days. He has also won the Pulitzer prize of "best international reporter."

After expressing his thankfulness at being able to talk to an American audience, and to look into faces where there is love and kindliness and sympathy and understanding, in contrast to those he met in Germany, Mr. Allen discussed his adventures at some length beginning with his assignment as the first American war correspondent to go with the British fleet in the Mediterranean. His assignment permitted him three years and 125,000 miles of travel with the fleet, during which time he saw every air and naval action in the Mediterranean up until the time of his capture late in 1942.

After relating in some detail his experiences at the hands of the Italians and Germans and discussing the many atrocities heaped upon him and other prisoners, Mr. Allen answered questions from his interested listeners.

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A large and deeply interested audience attended the banquet and heard Larry Allen's story of the European war

American Mining Congress Meetings Cancelled

COMPLYING promptly with the request of War Mobilizer Byrnes for "a cessation of group meetings," plans for the Annual Meeting of the American Mining Congress in Washington on February 14 and 15 have been cancelled. Speakers who had accepted invitations to address this meeting included prominent members of the Senate and House of Representatives, officials of the War Production Board and of other agencies dealing with metal, coal and non-metallic mines, and numerous mining leaders; and a large attendance of mine operators from all parts of the country had been anticipated.

Likewise announced is the cancellation of the 1945 Coal Mining Meeting of the American Mining Congress, scheduled for Cincinnati the week of May 14. Decision to cooperate unqualifiedly and immediately with Mr. Byrnes' request was made by officials of the Coal Division and Manufacturers Division of the Mining Congress in consultation with George L. Smith, Vice President, Rochester & Pittsburgh Coal Company and National Chairman of the Program Committee. In taking this action it was pointed out that, over a period of more than 20 years, the Mining Congress' Annual Coal Mining Conventions and Expositions have led the way in the modernization of mining practices, machinery and equipment; and that had it not been for this long-range program our mines would have been unable today to produce the immense tonnage of coal required for the prosecution of the war.

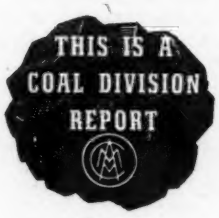
Previously, the Board of Governors of the Mining Congress' Western Division had decided that the customary Metal Mining Conference, tentatively planned for December or mid-January at a central point in the West, should be deferred until a later date, in view of the acute travel situation in the West and the uncertainties in both the domestic and international situation.

These annual conferences of mining leaders have made a distinct contribution to the progress of the mining industry and its all-out support of the war effort; however, in view of the urgency of the request from those responsible for war production and transportation, they have now been cancelled. Director Byrnes was promptly notified of this action in the following telegram from President Howard I. Young:

> "The American Mining Congress, representing the combined metal, coal and non-metallic mining industries of the nation, unhesitatingly accedes to your request for a cessation of group meetings at this time. Plans for the regular annual meetings of our Western or Metal Mining Division, our Coal Mining Division at Cincinnati, and our General Meeting in the East have all been cancelled. We are confident these meetings have done much to assist the mines to achieve the record production required for war and essential civilian needs and that the spirit of teamwork which they have engendered will carry on during the period for which further meetings may be banned. We again pledge our fullest cooperation in the critical task which lies ahead."

The Committees Report to the Annual Conference

A Resume of the Studies That are Being Made on Important Phases of Mining



By G. B. SOUTHWARD
Mechanization Engineer
American Mining Congress

COMMITTEE ON UNDERGROUND POWER

C. C. BALLARD
Chairman

THE work of this committee has been divided into several phases and subcommittees have been conducting studies on color coding, synthetic insulation, power distribution for A.C. and D.C. systems. This later report will submit charts that will enable a non-technical man to determine correct sizes of conductors for mine transmissions and distribution lines.

Color Code for Power Cable

The present color coding project of the Power Committee, as described by D. J. Baker, subcommittee chairman, is an extension of the color coding for distribution power cables approved here a year ago. The new work, now in progress, will attempt to color code motor and starter terminals. The adoption of such a code by the mining industry would facilitate and make safer the underground connecting of motors and starters.

The committee believes there is no similar project now being undertaken by way of the other standards organizations, such as NEMA, AIEE, ASA, or others. Nor can they find evidence that any similar sought-for standards have been approved by any other group. They know that some companies have already adopted their own standards and these are in conflict with each other.

The subcommittee is especially interested in the D.C. applications since the very large majority of coal mining applications would be for this kind of current. AC motor terminal color coding is yet to be considered, but is not believed to present any difficulties.

This committee wishes to keep its work entirely in harmony with that of other national standards organizations. As a base for the committee's DC proposals, it will therefore attempt to color code the terminals for the 12 classes of such motors recognized on pages 10 and 11 of the ASA publication C-6.1, published this year and entitled "Terminal Markings for Electrical Apparatus." This group comprises reversing and non-reversing, commutating pole and non-commutating pole types of shunt-wound, series-wound and compound-wound motors. Fortunately, in these 12 classes can be found 99.44 percent of the mining applications.

Synthetic Insulation for Cables

The first study of our subcommittee was the splicing procedure for synthetic insulated and jacketed mining machine cables; that report has been completed and published in the MINING CONGRESS JOURNAL. The meeting on December 14 was devoted to a general review of the physical, electrical and aging characteristics of synthetic insulations and jackets, and to a discussion of the effect of the introduction of the ground wire, as required by Bureau of Mines Bulletin 2-D. Dr. E. G. Sturtevant gave the Conference an outline of the new studies to be made.

In considering the properties of synthetic insulations and jackets, it has been pointed out that synthetic insulation is in general of lower physical characteristics, such as tensile strength and elongation, than those normally obtained with rubber insulations. The insulation resistance values obtained with Buna S now being produced are somewhat lower than formerly obtained with rubber, but so far as is known now, those lower insulation resistances do not detract greatly from the service characteristics of the cable. In aging, particularly on short-time laboratory tests, Buna S insulations are equal to or slightly superior to those of rubber. It should be remembered, however, that statement is based on laboratory tests and that it is not yet confirmed by long-time data. The bonding with synthetic materials is somewhat more difficult than with natural rubber, but by the use of special cements, adequate bonds, both between the insulation and the jacket and between the insulation and the conductor, apparently can be obtained.

To obtain further information on the serviceability of synthetic insulated and jacketed cables it was suggested that mine operators be circularized for their comments and experiences on the serviceability of these cables and that our committee prepare a report on the characteristics of synthetic insulating and jacketing materials.

In discussing the introduction of the ground wire as required by the Bureau of Mines Bulletin 2-E into mining machine cable, it was pointed out that the most important item to be decided was the size of that ground wire. In view of the fact that the National Electrical Manufacturers Association has sections dealing with both mining machine cable and mining machinery, it was felt that this subject should be referred to the National Electrical Manufacturers Association for their recommendations, both with regard to the size of the grounding conductor and to the increase in the outside dimensions that its introduction into the cable would make necessary. A letter will be written by the American Mining Congress to the National Electrical Manufacturers Association, to obtain their recommendations on these subjects.

Mine Electric Power Distribution Systems

The prime requisites of a proper electric power supply system for mining operations, as pointed out by

R. S. Sage in his preliminary report, are reliability and safety. Reliability implies day in and day out availability of electric power for instant utilization for lighting, ventilation, pumping, cutting, loading and hauling, as well as the many surface operations. Safety means, primarily, safety to the operating personnel; secondly, safety to the mechanical apparatus—protection against abuse which results in service outage, loss of production and in maintenance expense.

A power supply system which will thus insure the safe and economical operation of a mine must be planned with care and with the best available technical skill. Proper protection for electrical installations in and around mines pays dividends in maintained production far in excess of the investment involved.

The recommendations to be presented in this report are intended to cover particularly distribution systems for primary power at voltages of the order of 2,400, 4,160 (or higher). The apparatus connected in such circuits rarely or never is located in a gassy region of the mine. Therefore none of it described is considered to come within the category of permissible equipment which is intended to operate in explosive atmospheres. A subsequent section will deal with the distribution of secondary power at utilization voltages of 220 and 440, generally employed at or near the working face. It is appreciated that frequently motors for such drives as pumps, fans, and hoists operate at primary voltages.

These recommendations include the circuits from the point at which power is purchased from the utility company (usually through a transformer bank) the surface distribution lines and the primary power lines into the mine to the point where the low-voltage distribution circuits begin.

A number of typical circuit and switching arrangements are included from which that most applicable to a specific case may be selected and will cover surface stations, substation equipment, transformers, circuit breakers — fuses, disconnecting switches, grounding and underground stations.

COMMITTEE ON MECHANICAL LOADING

S. M. CASSIDY
Chairman

FOLLOWING the report on Maintenance Organization and Maintenance Practices which was completed during the past year and published in the MINING CONGRESS JOURNAL, the committee selected for their next project a study of methods of service haulage to determine the factors governing the selection of any particular system. It is believed that such a project will be timely and fittingly dovetailed with the joint report on underground transportation, from face to tipple, by mine cars and conveyors, which is being made by the Committee on Haulage Roads and the Committee on Conveyor Mining.

J. A. Younkins outlined the plan to be followed by the committee and said that the first step in the study of service haulage methods would be to determine, if possible, the extent to which underground conditions, such as roof, floor, draining, ventilation, influenced the choice of the equipment. To accumulate such data, a questionnaire was prepared last September, which was designed to give such information as roof conditions, method of timbering, method of mining, extent of drainage problem at the face, maximum grade against loads in rooms, the floor conditions; and the type of service haulage, whether mine cars, shuttle cars, transfer cars, conveyors, or combinations of these methods. A study of the replies received to date indicates a need for further information, particularly with a view toward establishing the next step in the project, which is to survey the extent of perfection or efficiency of the various methods within the limiting factors of each.

A further explanation was given by E. H. Johnson, who said that the purpose of the committee was not to attempt to tell the industry whether they should use mine cars, or if used whether of small or large size, or transfer cars or conveyors or shuttle cars. The committee is trying to find out for the benefit of the industry what might be called the limiting factors of efficiency in these various operating methods.

Depreciation and Obsolescence of Mechanical Loading Machines

A new project has been started and, under the direction of Newell G. Alford, data will be collected and a study made bearing on depreciation and obsolescence with mechanical loaders, particularly mobile loaders. Mr. Alford explained that the committee will gather actual experience data from coal operators, and from manufacturers, who will cooperate in this work, and establish a broad field of experience that can be expressed in such terms as will provide handy reference material, on questions of company policy, for proper depreciation charges for cost sheets. This study will incidentally develop factual information, that will be available if desired in connection with determining margins subject to Federal income tax.

It will be a long job and will take quite some time. Until the study is completed, tentative reports will be submitted which periodically will have to be revised, incorporating the experience that is gained in the intervals following the first tentative report.

The principal objectives and advantages of this work may be outlined briefly as follows: First, supplying a valuable guide for keeping loading equipment closer to the advanced development and design by the manufacturer. Second, furnishing data that will offer information for adequately providing funds for the replacement of old machines with newer or more efficient models, and helping to sustain the generally favorable competitive advantage of coal with other forms of fuel. In addition, mechanical loader life is doubtless less than present allowances for taxation, and this study and its tentative reports should largely remove the present speculative life expectancy from the realm of argument with Federal taxation agents.

COMMITTEE ON SURFACE PREPARATION

T. W. GUY
Chairman

DURING the past year the committee has conducted a study on methods of recovering fuel values from what was formerly waste product and considerable data has been assembled. In the October, 1944, issue of MINING CONGRESS JOURNAL a number of accounts were published covering complete seam loading, sludge recovery, reclaiming high-ash coal, salvage of mine refuse, and recovery through selective mining.

In addition to the accounts already published, other discriptions have been prepared and will be published in the near future. These include a report on a mine that has practiced complete seam loading and cleaning for several years and a plant that has installed washing tables to recover rejects from the primary cleaning plant.

At the Conference, Mr. Guy presented a summary of the results of the committee investigations and stated that individual reports show actual or potential recoveries of coal from mine refuse ranging from about 1 to 9 tons per 100 tons of the normal plant production. In some plants the

recovery is made by the normal cleaning equipment, others have separate equipment, and in most cases the plant uses a combination of the two. In plants producing metallurgical fuel, the coal recovered from refuse or from refuse and middlings products is shipped as steam coal; in mines producing steam coal, the recovered products are blended in some cases and in others sold for local or for special purposes. In these times it is probably safe to say that in every case such waste coal recovered has been profitable to the operating company, in addition to contributing a needed increase in coal production.

Among installations recovering coal from *cleaning plant refuse* and *middlings*, one shows a recovery equivalent to 14 percent of the feed to the primary plant and the recovered coal is blended and marketed with the product of the primary plant. Similar recovered products in other plants range from 1 to 12 percent of the primary feed products and in some cases they are sold profitably as separate products. Among a number of examples of *hand picking from refuse* on conveyors or on picking tables are recoveries of from 2 to 8 to 12 tons per man-day. The product in some cases is marketed with the normal production; in others it is delivered to trucks, and in some cases the reclaimed coal has carried a higher price than the normal shipments.

New Studies

Continuing as a phase of this same general subject, some additional reports are to be prepared by several of the committee members which will include (a) new methods of heat-drying coal; (b) middlings products; (c) electrostatic cleaning of fine coal; and (d) heavy medium processes for fine coal. In outlining the scope of these reports, J. M. Gonder briefly discussed the electrostatic method and explained that this operates on the principle that like electrostatic charges repel, and unlike charges or polarities attract. The material to be treated is fed by a slowly revolving roll of one polarity into an electrostatic field set up between the revolving roll and another electrode carrying the opposite polarity. Once in the field the material, which has the same polarity as the feed roll, is subject to electrostatic action, and as all materials are not equally active in the field, a separation takes place.

COMMITTEE ON HAULAGE ROADS

THE plans for representing the standards booklet "Construction and Maintenance of Main Haulage Roads in Coal Mines" are nearly completed. C. C. Hagenbuch, subcommittee chairman, stated to the Conference that all material in the previous publication of 1939 has been thoroughly reviewed and that the new edition, to be published in 1945, will be brought up to date in every particular. The chapter on "Frogs, Switches and Turnouts" will have several new designs; the articles on track maintenance have been revised, and some new material relative to tie spacing for various loads and weights of rail have been worked out and will be incorporated in the new handbook. Also there will be an edition relative to manufacturer's tolerance with respect to steel ties.

A new study, recommending "flangeway widths for frogs and guard rails" which will be included in the publication, is about completed and its purposes were explained by A. R. Anderson. He stated that the importance of clearance—that is, widths of flangeway and depth of flangeway and guard rail spacing—was not recognized at the time the first draft of the track standards was made, but the equipment manufacturers quite often run into difficulties because the wheels do not go through the flangeways in the frogs as they should. The correction involves questions of track gage, wheel gages, and flange contour and in making the study the subcommittee has collected data from the various equipment manufacturers and track manufacturers on what they are now making. All of that is being given consideration, so that the recommendations finally arrived at will be something that will accommodate existing equipment and will not deviate more than is necessary from what is now being made in the way of trackwork.

COMMITTEE ON SAFETY

WHILE no formal report was prepared for the Coal Division meeting, this committee has some interesting problems in process of solution.

James Hyslop, chairman of the Subcommittee on Mine Explosions and Fires, stated that plans are now complete for a study of his special subject and that a comprehensive report would soon be forthcoming.

The general meeting on Dec. 15 was well attended in both morning and afternoon sessions

One of the current tasks of this committee is to determine the principal features of the various types of fire-fighting equipment available for underground use. Plans are developing to conduct a number of appropriate experiments under practical underground conditions. The findings of this committee should prove most timely and helpful to the industry.

The rising importance in safety measures of all kinds in conserving precious manpower, property and work hours in the mines is expected to bring strong support and cooperation to this committee.

METHODS OF UNDERGROUND TRANSPORTATION

Joint Study by

HAULAGE COMMITTEE

C. C. HAGENBUCH
Subcommittee Chairman

and

CONVEYOR COMMITTEE

A. E. LONG
Subcommittee Chairman

AT a joint meeting of the Haulage Committee and the Conveyor Committee in June, 1944, it was decided to prepare two reports on coal mine transportation systems—one by the Conveyor Committee covering main and gathering belts, and one by the Haulage Committee covering track and mine cars. The thought is to present to the coal industry authentic data on each type of equipment—including installation, operating and maintenance costs—showing the fundamental factors which should be considered by a mine operation in planning a haulage system.

It is, of course, essential in making this study that each committee assume the same mining area and one that has physical and operating conditions that would be equally adaptable to conveyors or track, and to consider the haulage from *the room neck to the tipple* regardless of the method of face loading. It was therefore decided that each report should cover a mine with the following conditions: Seam height, 4 ft. 8 in.; production, 1,200 tons per shift on a two-shift operation; the mine to operate an area of 4,000 acres with a recovery of 85 percent that would give a life of 25 years; this area to be approximately 4 miles long by 1½ miles wide, with a shaft opening at the center of the 4-mile boundary line; level seam; butt entries to be driven off only one side of the face entries, and rooms to be worked right and left. Each committee is to use its own plan of a haulage system for developing and mining this area to completion.

In discussing this report at the Conference, Mr. Hagenbuch presented a mine map showing the plan prepared by the Haulage Committee for mining the area, and Mr. Long showed a lantern slide of the same area with the all-conveyor layout projected by the Conveyor Committee. He further stated that 250 volts D.C. was adopted as a part of the specifications; that rooms were to be drawn off both sides of the butt entries; that a 250-day year was assumed; and a 3 percent interest rate in the investment. Both subcommittees reported progress in the study, but further stated that many factors had to be considered and investigated before the report would be completed.

COMMITTEE ON MINE VENTILATION

W. E. HOUSMAN
Chairman

THIS committee was organized about a year ago and several phases of ventilation were proposed for study. A preliminary report as presented by W. E. Housman, chairman, will be published in the near future. At the Conference he gave a discussion of the report, illustrated by several lantern slides. An extract of his remarks are given below:

Ventilation Surveys

Ventilation surveys should record both volume and pressure distribution if corrections and relief are to be applied intelligently. The few hundred dollars expended for a pair of altimeters may be returned many times in the more efficient use of the initial air volume as the result of a comprehensive pressure-volume survey. Recent developments in altimeters have brought out instruments easy to handle, rugged in construction, and simple to read.

The ultimate effect of some obstructions in the air courses can only be determined by pressure readings. Air leakage, if scattered and at many points, can likewise only be evaluated by means of pressure-volume survey.

Ventilation Maps

Assuming that ventilation surveys are desirable and often essential, a good ventilation map is a prime requisite. By "map" is not meant the regulation mine map, although general ventilation data is given on such maps, but a map made to indicate and record ventilation data and little else. It should be on a fairly good scale — say 200 ft. equals 1 in.—and indicate by colors and arrows the course and direction of the intake and return air currents throughout the mine. By the use of suitable symbols, the location of doors, overcasts, stoppings, regulators, etc., may be shown. The pertinent data obtained in ventilating surveys should likewise be recorded on this map.

Air Volume Measurement

The correct methods of correctly measuring the volume of air are generally understood and have been emphasized in many discussions and papers. Your committee believes that too much emphasis cannot be placed on this subject, because such methods are not followed in practice.

Of prime importance is to know the correct volume of air delivered by the fan in the various main splits into which the air is necessarily divided. As an aid to obtaining uniformly accurate readings, it is suggested that, in all mines whose production and life expectancy warrant the expense, permanent measuring stations be established in each main split as close to the fan as convenient. At each such measuring station a smooth cross-section should be prepared flush with top, bottom, and sides of the adjacent air course with accurate cross-section in square feet determined, recorded, and preferably painted on the wall at each such station.

Future Studies

Among the subjects considered worth while for future study are the following:

1. A suggested procedure in detail for conducting pressure-volume surveys.

2. Possible effects or benefits resulting from the sinking of auxiliary or field air shafts.

3. Study of air leakage; cause and effect, with suggestions for locating major leakages and for avoiding them.

COMMITTEE ON COAL DUST ABATEMENT

D. H. DAVIS
Chairman

ONE of the problems of dust abatement is getting water to the working faces, and D. H. Davis outlined the factors to be considered. The first thing to do is to determine how much water is needed and when it is to be applied. If it is certain that a large quantity of dust is present and that no other method than complete piping will serve, then this expense may be justified. On the other hand, if there is some doubt as to whether complete piping is needed a detailed investigation of the problem is called for. A coal company has made a comparison between two methods of water distribution, one method was a complete piping of each working face, and the next was a cutting machine tank truck distribution with a water car on the section. As to the matter of cents per ton, it took about 1.75c per ton to pipe and complete the section, maintaining the pipe, and so forth, as compared to 0.75c per ton on the other method. The details of this investigation will be submitted in a Coal Division report which will be published in the MINING CONGRESS JOURNAL.

Water on Cutting Machines

This question was discussed in considerable detail by Mr. Arnold, who gave some very interesting figures on experiments conducted at one of the mines of his company. His discussion concerned spray nozzles, wetting agents, cutting practices, showing results in dust reduction in the various quantities of water and methods of application. His complete report will be published in MINING CONGRESS JOURNAL in the near future.

COMMITTEE ON ROOF ACTION

FRANK G. SMITH
Chairman

DURING the past two years the work of the committee has been somewhat preoccupied with mine roof sealing. That subject, however, as explained by F. G. Smith, chairman, is not primarily the work of the committee at all; primarily the object is investigation into causes. However, it was felt by following up on mine roof sealing, particularly painting, against weathering, they could find out some of the things they wanted to know about mine roofs.

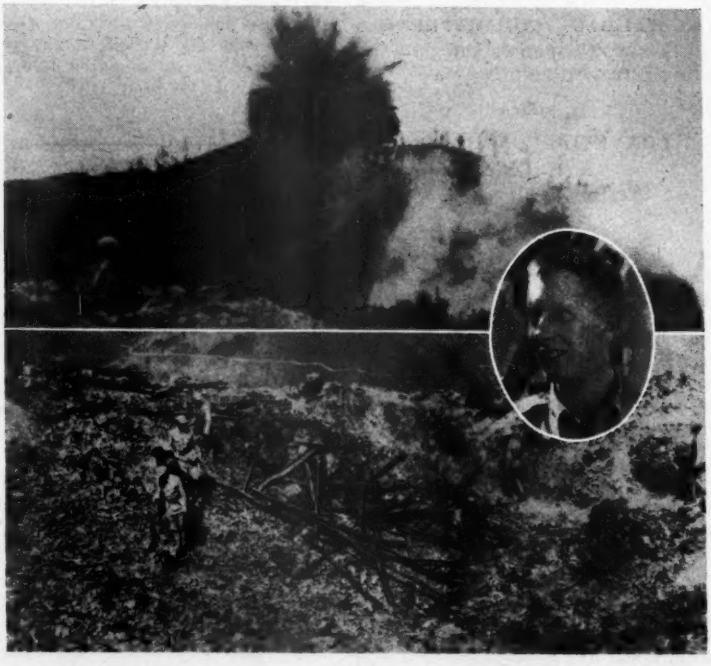
Three specific mine installations of sealing material are now under examination, they were observed by the committee at the time they were installed, and have since been investigated and visited several times by members of the committee.

The investigation included tests on the physical characteristics of the roof rock—expansion rate as affected by temperature and humidity, compression and tensile strength—and also a survey to locate and map fracture zones which occurred in the treated areas. These investigations determined that falls in certain portions of the roof strata are due to physical characteristics and not to weathering or other causes which sealing would prevent.

Roof Sealing

An interesting experiment was described by Henry F. Hebley. In order to get definite information as to the effectiveness of roof painting, a pair of mine entries were painted in alternate 100-ft. sections; in this way the effect of variables was reduced to a minimum. Detailed examination of the roof was, of course, made before the painting was applied. This application was made only about 8 to 9 months ago so that definite conclusions cannot yet be formed, but the treatment has not been 100 percent effective in preventing falls. However, the company feels that the experiment has been well worth while as the data taken and observations made have developed some interesting possibilities for further lines of investigation on methods to prevent falls.

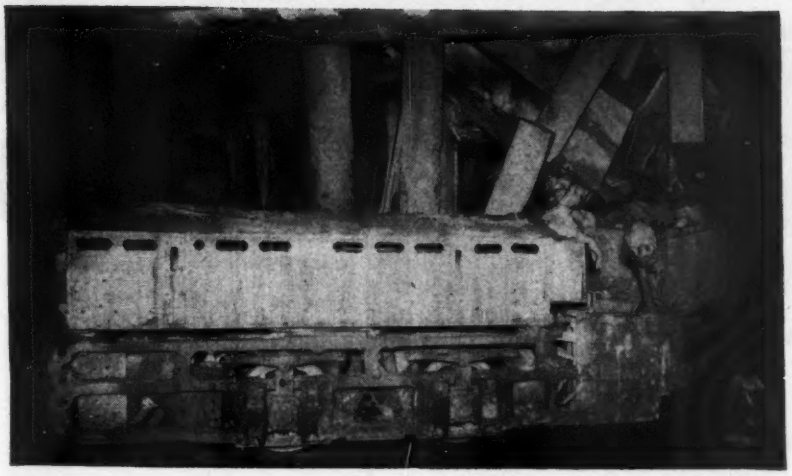
TUNNEL USED TO BLAST THE JAPS



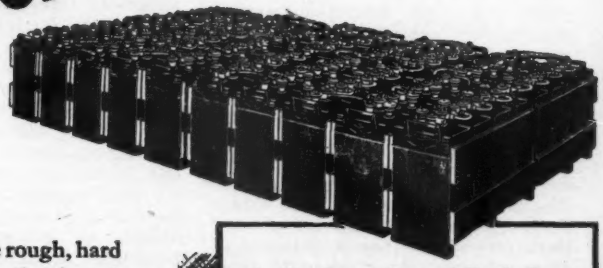
PETER S. HOPKINS, only 22 but already a captain, U. S. Army Engineers, is a member of the Y-Force Operations Staff, American military mission to China, which for nearly two years has been teaching the Chinese Army modern methods of warfare. Despite herculean difficulties raised by the Japanese blockade, they have supplied the Chinese with some American arms and ammunition flown in over the Himalayan "Hump" from India.

Captain Hopkins was assigned by Brig. Gen. Frank Dorn, of San Francisco, heading the American "Y" or "Yoke" Force, to assist the Chinese in reducing Jap positions at Sungshan ("Pine Mountain"), where the enemy guns, mounted on the seemingly impregnable mountain heights, swept the Burma Road far below.

This land Gibraltar, one of the Salween River objectives, fell to the Chinese only after the top of the mountain, and the Japs holding it, had been blown up by the 6,000 lbs. of TNT, packed in a tunnel bored into the mountain under the Jap positions. While the Chinese were driving their tunnel under the Jap positions, Japanese sappers could be heard at work driving a counter-tunnel under the Chinese diggings. The Chinese completed their's first, however, to blow the Japs into eternity.



BOTH are built for TOUGH service



Your locomotives and shuttle cars withstand the rough, hard usage of mine transportation because they are built of steel. Edison Alkaline Batteries are built for the same kind of tough service. Containers, covers, pole pieces and other structural parts of these batteries are built of steel. Even the active materials are locked in perforated steel tubes and pockets. These in turn are securely assembled into steel grids to form the positive and negative plates. The steel cover is welded onto the container.

Because of their steel cell construction, alkaline batteries are by far the most rugged of all storage batteries. When it comes to standing up in mine haulage service, they have no equal.

Alkaline batteries in locomotives have fallen down shafts and gone through many wrecks with little or no damage . . . and still delivered their full service life. The fact they can withstand such accidents, indicates the extra dependability that can be expected of them under more normal conditions. Their durable mechanical construction is also one of the principal reasons why alkaline batteries stay on the job and out of the repair shop, give longer life and help cut haulage costs. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey.*

In Mine Locomotives and Shuttle Cars Alkaline Batteries Give You These Important Advantages

- They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents; are free from self-deteriorating reactions.
- They can be **charged rapidly;** do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.
- They can **stand idle indefinitely** without injury, without attention, and without expense.
- They are **simple and easy to maintain.**

Edison
ALKALINE BATTERIES

WHEELS OF GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

BEFORE expiring on December 19, the 78th Congress, in extending the Second War Powers Act, added a protective amendment under which appeals may be taken to the Federal courts to secure injunctions against war agency orders which have suspended individual or company allocations of critical materials, or under which suspensions have been ordered for rationing violations. The freezing of the Social Security payroll tax at 1 percent for 1945 finally received Presidential approval. Senator Aiken's St. Lawrence Seaway and Power Project amendment to the Rivers and Harbors bill was finally disposed of by an adverse vote of 56 to 25, thus, in the opinion of observers, serving notice on the Administration that this Project is not to be handled by Congress as an executive agreement, but rather as a treaty, requiring Senate ratification.

As the 79th Congress convened on January 3, attention centered on the all-important appointments to the pivotal committees in the House and Senate. As the election returned all House committee chairmen to the present Congress, no House chairmanships are expected to be affected in the course of the Congressional organization. Former Representative Wesley E. Disney's majority seat on the Ways and Means Committee has been filled by the appointment of Clinton P. Anderson of New Mexico, but the Republican caucus has not yet filled the places vacated on this committee by former Representatives Treadway of Massachusetts and Dewey of Illinois. Christian A. Herter of Massachusetts and Paul Cunningham of Iowa, however, are being favorably considered for these two places.

For the Senate Finance Committee, the Minority Steering Committee has appointed Senator Albert W. Hawkes of New Jersey to fill one of the two minority vacancies.

Tax Discussion

In a report made on January 1, War Mobilization Director Byrnes, with the approval of the President, suggested three changes in the revenue statutes for the purpose of fostering the expansion of business enterprise. Byrnes' recommendations include: (1) the increasing of deductions for depreciation during early years of the life of business and industrial equipment; (2) increasing the specific exemptions from excess-profits tax from $10,000 to $25,000; and (3) the taking of steps to make post-war refunds on excess-profits taxes immediately available. The Director warned against the thought that any general relief from the existing tax burdens can be undertaken until after the defeat of Japan.

Director Byrnes' suggestions apparently come as a shock to the Treasury Department, the officials of which had been working with the Congressional Joint Committee on Internal Revenue Taxation in the preparation of plans for tax relief. Chairman George and Ways and Means Committee Chairman Doughton evidenced their concern over the abruptness of the Byrnes' proposals and have come forward with the statement that "speaking for ourselves, we see no prospect of any major changes in our tax laws —at least until after the war with Germany. We make no prediction as to what should be done at that time." Senator George had previously made the suggestion that, when justified by war developments, a horizontal cut of 10 percent might be made in Federal income taxes.

In the U. S. Tax Court an interesting case (Moore, Inc., Atlanta, Ga.) has been decided with the ruling that the liberalized capital gain and loss provisions of the Revenue Act of 1942 (under which long and short-term gains and losses of corporations could be lumped together) may be applied to the carry-over of net operating losses from a previous year. When the old provisions were in effect in 1941, Moore, Inc., had a short-term capital gain of $3,000 and a long-term capital loss of $17,000 and therefore claimed the benefits of the loss in establishing a net operating loss credit in computing its 1942 taxes. This claim was denied by the Bureau on the basis that the company was basing the carry-over claim on a loss sustained in 1941, and that the 1941 and not the 1942 law should apply. The Tax Court commented on the position of the Bureau by saying "Nor do we find any indication that Congress intended that the net loss carry-over was to be computed under the law effective when such net loss was sustained."

Tariff Report to Congress

Acting under a Senate-approved resolution introduced by Senator Brewster of Maine, the Tariff Commission is making a detailed study of articles on the dutiable and free lists in all cases where the imports in 1939 exceeded $100,000 in value or where imports of any article may, in the judgment of the Commission, exceed

Washington Highlights

CONGRESS: Opens 79th Session.

COMPETITION KEEN: For appointments on Congressional committees.

TAXES: Byrnes would speed depreciation and increase excess profits exemption.

TARIFF: Senate asks Commission for data.

MANPOWER: National Service Act again urged.

STEEL WAGES: Vinson approves "fringe" awards.

TRAVEL TIME: Supreme Court accepts certiorari.

FREIGHT RATE INCREASE: Further suspension order.

PREMIUM PRICE PLAN: Continued to July 31, 1946.

INCENTIVE PAY: Supreme Court says Wage-Hour Act applies.

QUASI CONTRACTS: RFC issues regulations.

that amount in the post-war period. Required to be submitted to the Senate not later than February 28, the report will cover (1) quantity and value of imports in 1939 and quantity and value of U. S. production, consumption, and exports in 1939 of the like, similar, or competitive article, the ratio of imports to domestic consumption, and the number of persons engaged in domestic production; and (2) probable short and long-term effects, with specific estimates wherever possible, of the changes in conditions which have resulted from the war upon the quantity and value of imports, and upon the production and number of persons engaged in production, the consumption, and the exports of the like, similar, or competitive article, to be estimated on three different bases—(a) if the duties in effect on July 1, 1939, were to remain in effect; (b) if they were to be reduced by 50 percent, and (c) if they were to be increased by 50 percent. In addition, the estimates are to be predicated on the following: (1) that the national income in the post-war period is approximately that which prevailed in 1939; and (2) that the national income will be 75 percent greater than in 1939.

Senator Brewster, speaking of his resolution, stated that it is important that Congress know as closely as possible what actual effects the changes in tariff rates are likely to have, in order that requests which are sure to be made for tariff adjustments may be properly appraised.

Manpower

With both the President and War Mobilization Director Byrnes calling for the enactment of laws under which the Nation's industrial and manpower resources may be mobilized, the Selective Service System has been called upon "to take such action in connection with its administering of the Tydings' amendment, as may be necessary to provide to the full extent permitted by law for the reclassification and induction of the men agriculturally deferred in the age group 18 through 25." Selective Service headquarters has accordingly wired State directors to direct all local draft boards (1) to promptly review the agricultural deferment of men in the 18 through 25 age group in view of the President's statement and (2) to arrange for the prompt pre-induction physical examination of registrants in this group, which is said to number 364,000 men.

Immediate "work or fight" legislation is apparently desired by the Administration and it has been strongly indicated by Director Byrnes that the House and Senate should take action compelling the men at present in the 4-F classifications to seek employment in war work or else be placed in such work through military assignment.

Steel Wage Awards

The steel wage awards, known as the "fringe" awards, of late November, were confirmed by Economic Stabilization Director Fred Vinson on Dec. 30. In a rather strangely worded statement, Vinson announced that the Office of Price Administration had informed him that certain price increases in the iron and steel industry had been found to be "necessitated by the minimum requirements of law" nearly a year ago, and that such increases are to be made without regard to the wage awards of the War Labor Board; but that, in the judgment of the Price Administrator, no further price increases will be required because of the wage increase awards. Vinson's line of thought was sharply criticized by steel company officials who stated that it is self-evident that a greater price increase is now necessary to meet the higher wage costs under the awards.

Travel Time Pay

The Supreme Court of the United States has accepted certiorari in the noted travel time pay case of the Jewell Ridge Coal Corporation. Counsel for the coal company, in filing the brief in support of petition for certiorari, emphasized the practice of over 50 years in the coal industry in computing time worked on a "face-to-face" basis and further stated that such was the practice under the National Recovery Administration Code in 1933. Also stressed was the widely known UMWA Earl Houck's letter which insisted that the Wage-Hour Administrator leave the coal industry strictly alone in his consideration of the portal-to-portal pay case of the iron ore miners of Alabama.

The dangerous trend of the travel-time pay issue is well illustrated in Wage-Hour Administrator L. Metcalfe Walling's announcement, effective December 4, 1944, affecting the West Coast logging and lumber industry. Walling stated:

"After full consideration of the problems involved in the determination of whether employes in the logging and lumber industry are engaged in work or employment, for purposes of the Fair Labor Standards Act, while traveling to, from, or between the sites of logging and lumbering operations, I have concluded that the Wage and Hours and Public Contracts Divisions, in enforcing the Act in the industry, will rely on the general principles announced in Interpretative Bulletin No. 13, interpreted in the light of the guidance provided by the Supreme Court in the case of Tennessee Coal, Iron and R. R. Co. v. Muscoda Local No. 123.

As to travel time Wage-Hour I. B. No. 13 has the following to say in part: "If a crew of workers is required to report for work at a designated place at a specified hour and all the employes are then driven to the place where they are to perform work, the time spent in riding to such place should be considered hours worked. Similarly, the time spent returning from the place at the close of the day's work should be considered hours worked. In some cases, however, the employer requests his employes to report for work at a specified hour at the place where the work is to be performed instead of at the employer's place of business. In these cases the employe's working time may be considered to begin at the time he reports for work, unless the traveling time required in order to reach the place where the productive work is to be performed is unreasonably disproportionate to the normal traveling time required in reporting for work at the headquarters of the employer. . . ."

Freight Rates Suspended

The Interstate Commerce Commission has ordered a further suspension of one year, to January 1, 1946, of the 4.7 percent railroad freight increase originally granted March 18, 1942, and later suspended in May, 1943, to January 1, 1945. This action came as a result of the November hearing on Ex Parte 148, reopened, and was accompanied by the statement that in view of the uncertainties facing railroads and shippers alike, the case will be held open, permitting requests from either side for further action if conditions change. The Commission added that "As long as freight and passenger traffic continue on their present levels, there is little reason to fear further decline in net railway operating income and in net income below the levels in recent months."

Future of Premium Prices

As the result of recent discussions regarding extension of the Premium Price Plan on copper, lead and zinc beyond July 31, 1945, Metals Reserve Company is understood to be working on the preparation of recommendations to be made to the Congress. It is generally assumed that a one-year extension is under consideration involving the "B," "C" and Special Copper premiums in addition to the basic "A" premiums. Action of Congress for continuance of premiums is expected either through an appropriation, or through lifting restrictions in the Price Stabilization Extension Act which prohibit all "subsidy" payments after June 30, 1945 (Taft Amendment) unless specifically authorized by Congress.

(*Continued on page 73*)

Personals

Arthur S. Knoizen, director of the mining division, War Production Board, has announced his resignation effective January 1. Mr. Knoizen, vice president of the Joy Manufacturing Company, came to WPB in De-

cember, 1942. His outstanding performance of the difficult task of keeping the mines supplied with equipment has earned him the appreciation of the entire mining industry.

J. M. Coppinger, J. A. Barr, H. A. Reuss, J. H. Hunt and H. B. Baylor of the International Minerals and Chemical Corporation in Chicago, recently received service pins for 30 years or more of service to the company.

A. F. Whitfield, Jr., secretary-treasurer of Clover Splint Coal Co., was recently elected president of the Harlan County Coal Operators Association. C. V. Bennett, president of Harlan Central Coal Co., was elected vice president and George S. Ward was re-elected executive secretary and treasurer. The executive board members are: Pearl Bassham, Kenes Bowling, R. W. Creech, Jr., W. J. Cunningham, S. J. Dickenson, J. S. Greene, Charles S. Guthrie, Elmer D. Hall, P. O. Lewis, J. S. Robinson and J. E. Taylor.

E. F. Wright, Jr., has become superintendent of the Clover Splint Coal Company at Closplint, Harlan County, Ky. He was formerly general superintendent, Southern Mining Company at Insull, Ky.

O. W. Bilharz of Baxter Springs, manager of the Bilharz Mining Co., has been elected president of the Tri-State Zinc & Lead Ore Producers Association. Hamilton A. Gray of Joplin is first vice president and George W. Potter of Joplin is second vice president; L. G. Johnson of Baxter Springs is treasurer and Fred F. Netzeband of Joplin is acting secretary in the absence of Capt. James K. Richardson. R. H. Beck succeeds his father, C. A. Beck of Miami, as a director. Mr. Gray and H. G. Weidman succeed John A. Robinson and R. O. Gibson as directors.

Gyles B. Pyles, maintenance superintendent for the Oliver Iron Mining Co., was recently elected president of the Engineers Club of Northern Minnesota. William Matheson, Jr., of Chisholm is vice president, and Paul P. Swanson of Nashwauk, secretary-treasurer. Directors are Robert Ely, Eveleth; A. F. Benson, Virginia; R. J. Maturi, Chisholm; C. B. Brannen, Hibbing; A. J. Boudreau, Keewatin, and E. A. Friedman, Coleraine.

L. E. Briscoe has been appointed chief engineer of the Ayrshire Collieries Corporation which has operations in Clay, Pike and Vermillion Counties, Indiana.

David H. Loach, general mine foreman, has been promoted to superintendent of the Docena mine of Tennessee Coal, Iron & Railroad Company.

A. H. Bunker, chief of staff of WPB, has resigned his post because of ill health. His resignation was announced December 19 by J. A. Krug, chairman.

E. A. Williford, sales manager, National Carbon, Inc., and for a number of years active in the affairs of the Board of Governors of the Manufacturers Division of the American Mining Congress, has joined General Aniline & Film Corporation as vice president in charge of the company's Ansco Division.

P. C. Smith has been appointed assistant to manager of the Transportation and Generator Division of the Westinghouse Electric & Manufacturing Company, according to an announcement by L. B. McCully, manager.

Mr. McCully also announced the appointment of J. S. Askey, G. L. Moses and P. G. Lessman as section engineers in the department.

At a recent meeting of the board of directors of the Georges Creek and Upper Potomac Coal Association the following officers were elected: President, Arthur B. Stewart, Baltimore, Md.; vice president, George D. Campbell, Piedmont, W. Va.; secretary-treasurer, R. L. Stallings, Cumberland, Md.

Dr. Thomas B. Nolan was formally inducted, December 20, as assistant director of the Geological Survey by Secretary of the Interior Harold L. Ickes. He is a native of Greenfield, Mass., and joined the Survey staff in 1924 after finishing postgraduate studies in geology at Yale University. His work is outstanding in geology and economics of deposits of metals and in related fields. In later years he has devoted much time to problems of planning and management. Because of the Geological Survey's growth in activities and staff, he has been called upon increasingly by the director as consultant and special assistant in important administrative matters, and has several times served as acting director.

At the annual meeting of the Oregon Mining Association: S. H. Williston of Horse Heaven Mines was reelected president; Irving Rand was elected vice president and secretary. Other directors are: Worthen Bradley of the Bradley Mining Co.; H. C. Wilmot of Bonanza Mines; D. Ford McCormick of Cordero Mining Co.; Leverett Davis of Callahan Mining Co., and F. W. Watson. Offices of the association are now at 1107 Public Service Building, Portland 4, Oreg.

Dr. Charles Lathrop Parsons of Washington, D. C., for 37 years secretary of the American Chemical Society, and former chief chemist of the U. S. Bureau of Mines, received the honorary degree of doctor of science on December 17 from the University of New Hampshire, where from 1892 to 1911 he was a professor of chemistry. The degree was conferred at ceremonies inaugurating Harold Walter Stoke as tenth president of the university.

Fred Searls, Jr., well-known mining engineer, who has rendered important service in the War Production Board and other government agencies since the beginning of the war is again assisting War Mobilization Director Byrnes.

R. L. Kidd, formerly associate professor of mineral dressing at the South Dakota School of Mines and Technology in Rapid City, recently became a member of the staff of the Southwestern Engineering Company of Los Angeles.

James W. Tyson II has been elected vice president of Eastern Gas and Fuel Associates, Boston, Mass. Mr. Tyson in 1934 became assistant treasurer of Koppers Coal Company, later

the Koppers Coal Division of Eastern Gas and Fuel Associates. He will continue to make his headquarters in Pittsburgh.

Mr. Tyson is a member of the Controllers Institute of America, a member of the Coal Committee, and a director of the First National Bank of Bluefield, W. Va.

Alwin C. Eide has been elected vice president of the American Zinc Sales Company and the American Zinc Oxide Company, wholly owned subsidiaries of the American Zinc, Lead and Smelting Company. It is also announced that **Richard A. Young**, manager of the Dumas, Tex., plant has been elected a vice president of American Zinc Company of Illinois.

Marion E. Chapman was recently elected vice president in charge of sales of the Virginia Bridge Company to fill the position left vacant at the death of **B. L. Sneed**. Mr. Chapman was also elected a director of the company.

Elmer C. Salzman, vice president in charge of sales for Robins Conveyors, Inc., Passaic, N. J., has recently arrived in Rio de Janeiro on company business. His visit, of about one-month duration, will take him to the property of the Rio Doce Mine where Robins is preparing a system for conveying iron ore.

Robert S. Moehlman has left Reno, Nev., to assume the duties of field geologist for the South American Development Company, operating mines in Ecuador and British Columbia. For the past nine years he has been in the geological department of Anaconda and since 1940 has been in Reno in charge of western exploration work, including development and drilling at Copper Canyon.

Oscar A. Glaeser, safety engineer for U. S. Smelting, Refining and Mining Co., and **M. D. Paine** of the Tintic Standard Mining Co., and **B. L. Sackett**, general superintendent, International Smelting and Refining Co., are members of a committee appointed to revise the metal mine safety rules for the State of Utah. The committee will work with **R. D. Dalrymple**, who is head of the mine safety division, Utah Industrial Commission.

Fred Loving, Jr., has been appointed superintendent of the Southern Mining Co., Insull, Harlan County, Ky. He formerly represented the Hercules Powder Company.

Frank W. Newquist, formerly employed by Basic Magnesium, Inc., at its test plant in Golden, Colo., and its property at Luning, Nev., is now research engineer at the Mining and Metallurgical Research Experiment at the University of Utah, Salt Lake City.

Howard Kegley, oil and mining editor of the Los Angeles *Times* was recently re-elected president of the Mining Association of the Southwest. **H. W. Howe**, **John Herman** and **John Carter Anderson** were elected vice presidents, **Victor J. Hayek** was re-elected secretary-treasurer.

Directors chosen are: **H. Clifford Burton**, **George W. Clemson**, **C. W. Fernholtz**, **J. Percy Hart**, **W. W. Hartman**, **George I. Holmes**, **M. J. Holmes**, **Fred W. Koehler**, **Oscar L. Mills**, **George D. Nordenholt**, **P. J. Osdick**, **H. A. Van Loon** and **V. B. Wheedon**.

B. H. McCrackin has been appointed general manager of the coal mining division of the Republic Steel Corporation. He was formerly a member of the coal and ore mine division of the company's Cleveland office, and was also formerly associated with the Consolidated Coal Company at Frostburg, Md.

Deputy state mine inspectors under **Clifford J. Murdock**, Arizona State Inspector-elect, are to be **C. C. Newens**, Phoenix; **William Kucher**, Safford, and **J. C. Anglin**, Bisbee. All were deputies at one time or another under the late Tom C. Foster. Mr. Murdock campaigned for the state post in the recent election.

The appointment of **Edwin H. Johnson** to the newly created position of chief engineer of mines for Republic Steel Corporation has been announced by **C. M. White**, vice president in charge of operations.

For the past nine years Mr. Johnson has been serving as a mining engineer in the Mining Sales Division of the Jeffrey Manufacturing Company, Columbus, Ohio. Mr. Johnson's work will be in connection with both Republic's coal and iron ore mines in the Lake Superior district, Northern New York State, Western Pennsylvania, Kentucky and Alabama. He will make his headquarters in Cleveland.

George H. Roseveare, former metallurgist for the U. S. Vanadium Corporation, at Salt Lake City, Utah, has assumed the position of metallurgist with the Arizona Bureau of Mines at the University of Arizona in Tucson.

— *Obituaries* —

William W. Jamison died in Greensburg, Pa., December 24. He was 83. He played a prominent part in the coal development immediately adjacent to Greensburg and was associated with the Jamison Coal Co., formed by Mr. Jamison and his brothers.

Arthur P. Jones, mine superintendent of the Miami Copper Company, died on December 1, in Miami, after a short illness from a throat infection.

Turner Ashby Payne, 85, died October 27 at Moultrie, Ga. He was long active in Alabama coal mining and was identified with the operations of the Sloss-Sheffield Steel & Iron Co. at Blossburg.

Arthur E. Marriott, 62, died October 27 at Moberly, Mo. He was one of the owners of the Marriott-Reed coal mine in Callaway, Mo., and was also interested in the Marriott-Reed strip mine at Lindberg, Mo.

J. K. F. Brown, assistant general manager, Hudson Coal Company, in charge of engineering, died at Scranton, Pa., November 7.

R. E. Head, 65, senior mineral microscopist, U. S. Bureau of Mines, Salt Lake City, died November 28.

A. M. Musgrave, 79, formerly superintendent of the Nonae and Brookshire coal mines of the Colorado Fuel and Iron Corporation, died at Canon City, Colo., November 29.

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Want to cut drilling time per round up to 50%, while often increasing rock breakage 25%? That's usually the result when a mine places a Cleveland Jumbo with our drifters underground. You also gain many other important advantages listed at the right.

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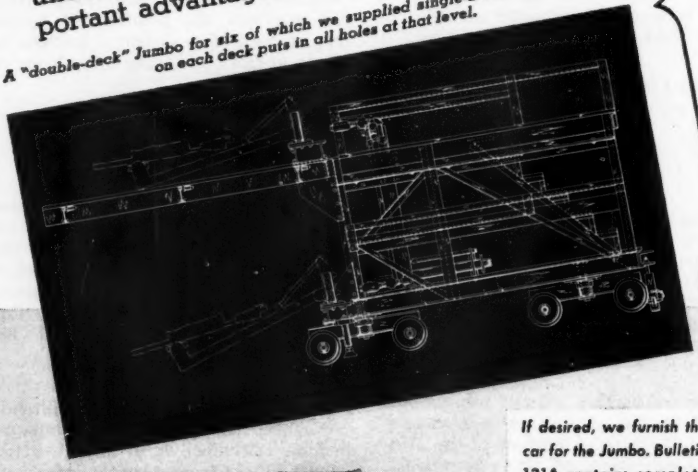

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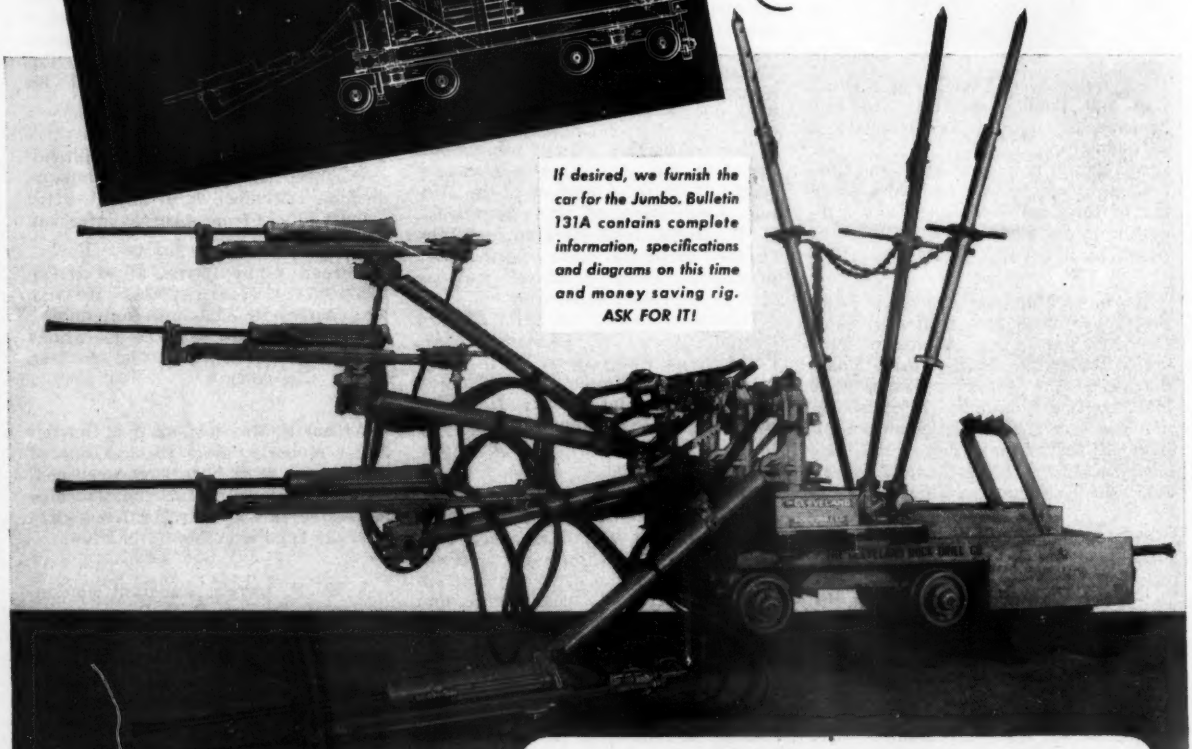

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NEWS and VIEWS

Staff Sergeant Archie Mathies, first coal miner to win the Congressional Medal of Honor.
A new coal mine at Eagle, Pa., near Pittsburgh, has been named for him

Eastern States

Maltby to Be Unwatered

For the purpose of increasing the production of anthracite, the Lehigh Valley Coal Company has started to pump the water from their Maltby operation, abandoned more than 10 years ago. The permanent pumping plant will include two 1,500-gal. pumps, against a head of 465 ft., operated by 2,200-volt motors. When the mine is unwatered, a new fan will be required for ventilation—it will have a capacity of 250,000 cu. ft. per minute and will require a 300-hp. motor.

Proposed Anthracite District Authority

J. P. Eyre Price, Scranton District manager of the War Production Board, told this to the Minute Men of the Scranton Chamber of Commerce: The Scranton area of the anthracite coal field faces a dual post-war problem—depletion of natural resources and reconversion of industrial plants from war to peacetime production. He said the problem can be solved by intelligent planning by management and labor and public officials, business and professional men.

Mr. Price proposed the establishment of an Anthracite District Authority, which would select a planning board. Prominent on the planning board would be a nationally known man without local connections, but capable of solving the problems so important in the post-war period.

Fees for Reorganizing Considered Too High

Federal Judge William H. Kirkpatrick considered the claims of four bondholder protective committees, 12 Philadelphia and New York law firms, 9 other specialists for fees of $1,134,650 for services rendered to the Philadelphia & Reading Coal & Iron Company in its financial reorganization under the Federal bankruptcy law. Judge Kirkpatrick allowed each claimant to make an oral statement supplementing the basis for his claim in the written petition.

The company filed a voluntary petition for reorganization in 1937. In July, 1944, Judge Kirkpatrick confirmed a plan which reduced the capitalization of the company from $61,000,000 to less than $12,000,000.

Coal Mine Accidents

Final figures on injuries in coal mines in the United States in 1942—the first full calendar year of American participation in the war—reveal that accident-frequency rates that year were the lowest since 1930 and that production of coal per man-hour of work was the highest in the nation's history, according to the Bureau of Mines Bulletin 462, "Coal Mine Accidents in the United States—1942."

Compilations show 530,861 men employed in anthracite and bituminous mines in 1942, a decline of 15,831 from 1941. These employes produced a record total of 640,000,000 tons, of which 582,000,000 came from the bituminous fields and 58,000,000 from the anthracite region of Pennsylvania. The average bituminous miner produced .753 of a ton per man-hour and the average anthracite miner .424 of a ton.

One thousand four hundred and seventy-one men were fatally injured and 69,564 men suffered nonfatal injuries that disabled them for more than the remainder of the day on which the accident occurred. Assuming a uniform payment of $5,000 for each fatality and $100 for each nonfatal accident, the Bureau estimated that injuries cost the nation about

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$14,311,400 in compensation payments.

Although the number of accidents was greater in 1942 than in 1941, the accident-frequency rate actually was lower than the previous year's because the rate is based on man-hours of exposure, and the 910,000,000 man-hours worked in the nation's mines in 1942 represented an 11 percent increase over 1941. In bituminous mines there were 1,072 fatal accidents in 1941 and 1,245 in 1942; nonfatal injuries increased from 46,637 in 1941 to 53,193 in 1942. Chief causes of accidents in both bituminous and anthracite mines were falls of roof, first, and haulage (transportation) second.

Will Direct Plan to Conserve Coal

Pennsylvania State Secretary of Mines Richard Maize was named director of coal conservation by Governor Edward Martin. The appointment of a conservation chief was requested by Abe Fortas, acting Secretary of the Interior, Washington. Objectives of the plan comprehend "the stimulation of coal production and the conservation of its use as necessity demands."

Anthracite Coal Conferences Will Be Resumed at Lehigh University

A. C. Callen, dean of the College of Engineering, Lehigh University, has announced the resumption of the Annual Anthracite Coal Conferences. These conferences, a featured event in Lehigh University's spring program, have been postponed since 1941 because of war conditions.

Conference officials and committees met December 21 for the purpose of planning the program of the meeting, which will be held probably in May, 1945. The technical papers to be delivered will feature the progress made in the production and utilization of anthracite during the past few years.

Quigley Heads Mine Inspectors Association

James M. Quigley, of Mount Carmel, mine inspector in the Twenty-third Anthracite District, was elected president of the Anthracite Mine Inspectors Association at the annual meeting in Hazleton. Other officers are: James Munley, Archbald, vice president; Kenneth Lee, Wilkes-Barre, secretary; and T. I. Wackley, Scranton, treasurer. The association is in its third year, and meetings are held monthly.

Hamilton Wright Photo.

"Mike," 17-year-old bituminous mine mule in a mine at Gaily, Pa., will get his "H" for HAY—his boss, Louis Allen, who has worked with Mike for 14 years handling 150 tons of coal a day, will make the award. Mike hasn't had a day off since Pearl Harbor

The Magic City

Birmingham, center of the mining and manufacturing industry of Alabama, celebrated its seventy-third birthday on December 19, 1944. Birmingham started as "a place where two railroads crossed," and its first buildings consisted of two section houses and a blacksmith shop and a box car for a depot. Today, Birmingham has a population of more than 300,000, in an area of 53 square miles, with about 600 manufacturing plants and 9 trunk-line railroads.

It was named after the industrial city of Birmingham, England, and has been developed along similar lines. Shortly after its founding, furnaces were built, coke ovens established, and the production of pig iron begun. Nature has favored the location wonderfully by placing the three essentials for iron production—coal, iron ore, and limestone—in close proximity so as to enable the establishment of centrally located furnaces.

With the coming of the steel age, Birmingham's growth was magical, and so the designation, "The Magic City." The first ladle of steel was poured from the new furnaces of the Tennessee Coal, Iron & R. R. Co., at Ensley, on November 30 (Thanksgiving Day), 1899. Today the steel mills of this company, with 10 open-hearth furnaces, make this the second largest plant of this kind in the world.

One of the major products of the steel mills of the Tennessee Company is railroad rails. Recently orders have been received from several southern and western railroads for this item. The total of orders now on hand will give the local mill full operation for something like two years—some 350,000 tons.

Steel operations at Birmingham for the week ending December 16 remained steady at the mark of 95 percent, as compared to 96½ percent for the nation's average.

Resolutions Reported at Charleston Meeting of West Virginia Coal Mining Institute, November 24*

YOUR Committee on Resolutions begs leave to submit the following report:

We . . . commend the officers of the Institute for stressing safety and efficiency at this annual meeting.

We also commend Chief Jesse Redyard, of the State Department of Mines, and Commissioner Charles L. Heaberlin, of the Workmen's Compensation Department, for their active and continuing participation in the promotion of safety.

During 1943 West Virginia coal mines wrought a new record in safety, producing 493,629 tons per fatal accident. At the end of September, West Virginia mines had produced 126,388,009 tons of coal, with 561,724 tons per fatality, compared with a production in a similar period of 1943 of 120,295,857 tons, and 479,266 tons per fatal accident.

These records have been made when supplies and equipment have been scarce and production was being speeded under governmental demand.

* * * * *

Be it Resolved, That the West Virginia Coal Mining Institute deplores the tendency of the Government to encourage strikes by temporizing with petty and arrogant strike leaders, and condemns such strikes in a period of war as an injustice to our fighting forces and an obstacle to the nation's military objectives.

* * * * *

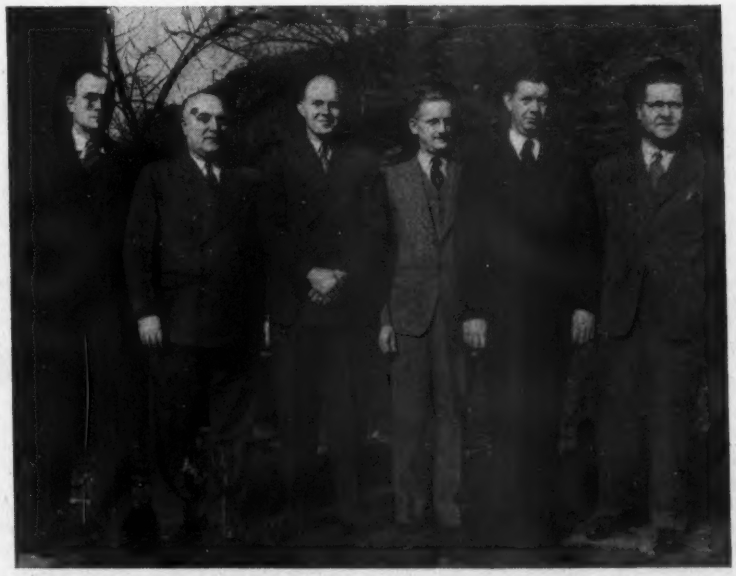
Be it Resolved, That the West Virginia Coal Mining Institute commend the West Virginia coal mining industry for its record performance in coal production; that governmental and legislative social reforms should not be enacted in such a manner as to detract from this supreme effort; that such education efforts as are deemed necessary be endorsed, particularly those seeking to reduce absenteeism, the mining of coal more efficiently and more economically, and the promotion of safety.

WHEREAS in response to the expressed demand of our Government, West Virginia miners and operators have cooperated in breaking all previous records in the production of coal from the mines of West Virginia in a patriotic effort to satisfy the unusual demand of war industries for coal to provide supplies, equipment and ammunition to prosecute the war against aggressor and barbaric nations, we extend to such operators and miners our full and free appreciation of their gallant contribution to the cause of liberty and freedom, to those who have been remiss and through voluntary absenteeism have retarded the mines in securing increased production, we leave them to the memory of those sons of West Virginia who have offered to make the supreme sacrifice that individual liberty should not perish and that America should remain free to grow and thrive on those principles which have guided a nation to unparalleled greatness and commanding stature, through heroism, self-denial, and the spirit of sacrifice.

Your committee expresses its appreciation to the legislature of 1943 for giving to the coal industry, along with all other forms of business, industry, and the professions, a 10 percent reduction in the payment of gross sales taxes. The interim since that action has recorded that no department, institution, or service of the state government has been suspended or its functions impaired by this reduction in state taxation. The records show that while a 10 percent tax reduction was accorded coal and other industries in 1943, that in 1944 the gross sales taxes paid by the coal industry increased during the fiscal year ended June 30, 1944, by $417,743, or an increase of 8.46 percent after the tax reduction had been granted. We believe that the legislature of 1945 should adhere to the policies and practices of the 1943 session and give to industry an opportunity to effectuate reserves that will be helpful to expansions and improvements to allay post-war unemployment.

WHEREAS there are now pending in Congress bills proposing the construction of dams for the generation of electric power under the guise of flood control; that by making huge expenditures for water power projects the Congress is thereby using the public revenues to depress and destroy the private electric power industry and the bituminous coal industry; that by seeking the enactment of legislation of this character the Congress is subsidizing a laborless form of energy and sacrificing thousands of jobs in the coal industry, the largest labor-employing industry among the mineral fuels. We condemn this vicious legislation and urge our Senators and Representatives in Congress to oppose all such measures of this character which tend to destroy the coal industry and promote unemployment.

*A full report of this meeting appeared in the December MINING CONGRESS JOURNAL.



New executives of Island Creek Coal Co. and associated companies were announced January 6 by James D. Francis, president. Left to right: C. E. Walker, Gen. Mgr., Pond Creek Pocahontas Co.; J. J. Foster, Gen. Mgr., Island Creek Coal Co.; W. A. Haslam, Gen. Mgr., Marianna Smokeless Coal Co.; F. A. Rouse, Auditor, the Marianna Company; F. E. Clevenger, Ass't to Vice President in Charge of Operations; F. C. Honchell, Auditor, the Island Creek Co.

Trade School at Pineville, W. Va.

Night classes for employed men started at the Wyoming County Trade School recently with courses offered in welding, machine shop, and electricity. These classes run three nights each week, Monday, Tuesday and Thursday, from 7 to 10.

Classes in arc welding are conducted by L. L. Crane. Machine-shop classes are under the instruction of Rene Butler, and N. A. Wallen conducts the course in electricity.

"The Marianna Smokeless Coal Company, through W. A. Haslem, superintendent, has donated both time and some equipment to help make this school a success," said Okey E. McCourt, director of the trade school. "Several men are now enrolled as students in the school's night classes.

"Men who desire training should have the recommendation of their foreman or superintendent before applying for training at these classes," Mr. McCourt added.

"Recognizing the importance of trained men in modern industries, and the fact that there is a fine training school available right here in our own county for employed men, we should all appreciate this school and that it has to offer our employes in making them better fitted for their jobs. I am glad to recommend this school to the employes of the Marianna Smokeless Coal Company and hope that as many as possible can and will enroll for training in its night classes," stated W. A. Haslam, superintendent of the Marianna Smokeless Coal Company, who analyzed the situation as follows:

"Another thing of importance is the training of high-school youths who will be the future employes of our company as well as other companies in this county. But possibly the most important thing of all is what this school will have to offer our boys after their return from the battle fronts. Many will be unable to do manual labor because of wounds received in the war. In this school they can learn trades that will rehabilitate them. It is to them that you and I owe everything. And it is the part this school can play in their future that is most important to all of us."

Conveyor Belt Has Long Life

After setting a record of service, one of the first underground conveyor belt systems is scheduled for partial retirement in the Peter White Coal Company mines, Panther, W. Va. It was installed 21 years ago.

Produced by Goodyear Tire & Rubber Company, two belts comprising the first installations in the conveyor belt system started operating in May of 1923, and since then have carried millions of tons of soft coal to the tipple. A large portion of the original installation will continue in service after portions have been replaced.

The original conveyor system consisted of a belt 975 ft. long, starting under the car dump, which carried the coal downward at an angle of 8 degrees for one portion of the flight and 16 degrees for another portion. A second belt, which delivers the coal to the rail tipple, is 925 ft. long and carries the coal downward at an angle of 16 degrees.

Subsequent to installing the original system, a duplicate system was installed to insure against shut-downs. It has since been shown that shut-down due to conveyor failure is not a problem. Portions of the duplicate system will replace the original belts.

The conveyor belt system was designed for 150 tons per hour at a speed of 150 ft. per minute. The belts are 36 in. wide and, as originally produced, bore a rubber cover of three-sixteenths of an inch over eight plies of fabric.

New Illuminants Aid Safety

Expanded uses of new and better illuminants in the home, factory, farm and mine will reduce accidents caused by inadequate and improper lighting, according to Samuel G. Hibben, director of applied lighting for the Westinghouse Lamp Division, Bloomfield, N. J., speaking at a 15-state safety conference at Atlanta, Ga.

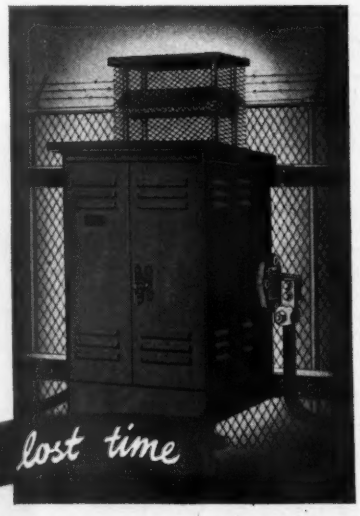
"Every home in America could be well lighted if the cost of home accidents during the past year, more than one-half billion dollars, were to be spent for improved lighting. After the war we will be able to light our way to safety with new types of illumination as never before."

Mr. Hibben pointed to the advantages of phosphorescent coatings on furniture and instrument panels for night use and to a new shock-proof lamp which in particular kinds of rough service, will be less likely to break because it has a shock-resistant filament and the bulb has a protective lacquer jacket.

The miner's lamp of today has been a "major factor in attaining safety underground," Mr. Hibben said. Since it operates from a battery on the miner's belt, it must give maximum brightness despite low voltage and weight limitations.

"We attain this with a special gas-filled lamp which gives 30 percent more light than vacuum type flashlight bulbs." The gas used in these lamps is inert and cannot support combustion and the lamp has a spring socket. If the bulb is accidentally broken, this "mechanical fuse" ejects the lamp and base from the socket instantly so the filament will not glow.

I-T-E
AUTOMATIC
RECLOSING
CIRCUIT
BREAKERS...



Reduce lost time

Unattended Sectionalizing Circuit Breakers stand guard twenty-four hours a day to localize electrical disturbances and resume service the moment lines are cleared.

Not only is continuity of service improved, but fire hazards are reduced, maintenance lessened, total energy and power demand lowered.

WRITE FOR CATALOG 2502

I-T-E AIR SWITCHGEAR

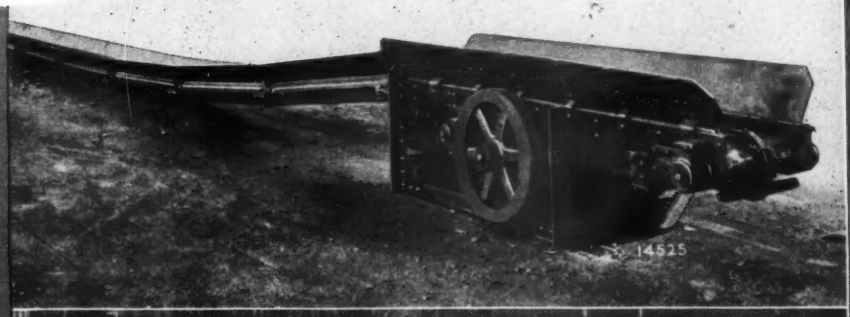
Representatives in Principal Mining Areas

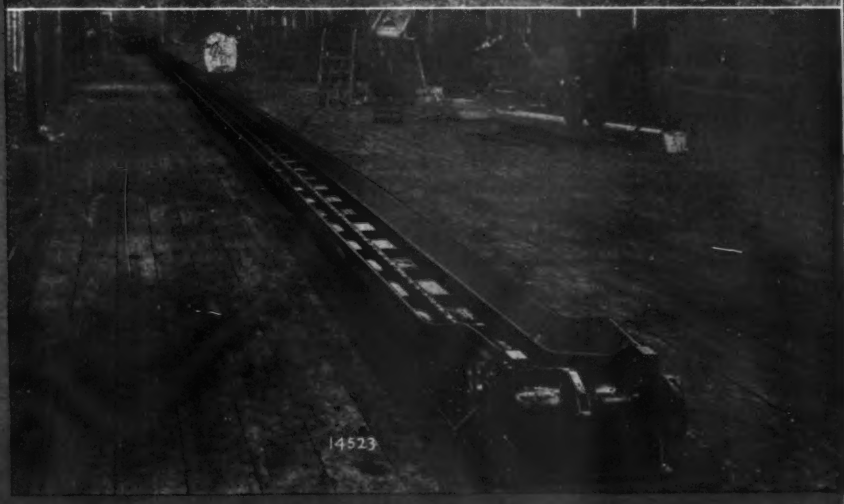
JEFFREY

Mechanical Mine Equipment Since 1880

CONVEYORS

Among the first methods used for continuous transportation of coal. The views on this page show the head and tail end of a Jeffrey Conveyor of twenty-five years ago.



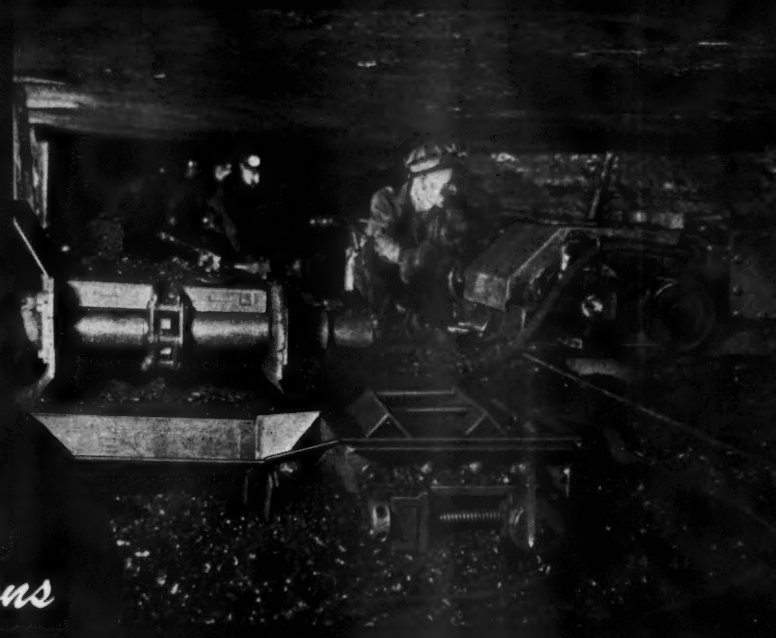


JM

BUY WAR BONDS

Left—Face operation showing actual loading at the face in a 32-inch seam of coal.

Right—Loading point on butt heading of battery of chain conveyors.



Modern Installations of

JEFFREY C

Top—Showing loading point of butt entry conveyor used in conjunction with chain conveyors for conveying coal to main heading.

Bottom—Showing discharge of belt conveyor in a 100% conveyorized mine, belts being used from chain conveyor heads as haulage to the tipple.

341-37

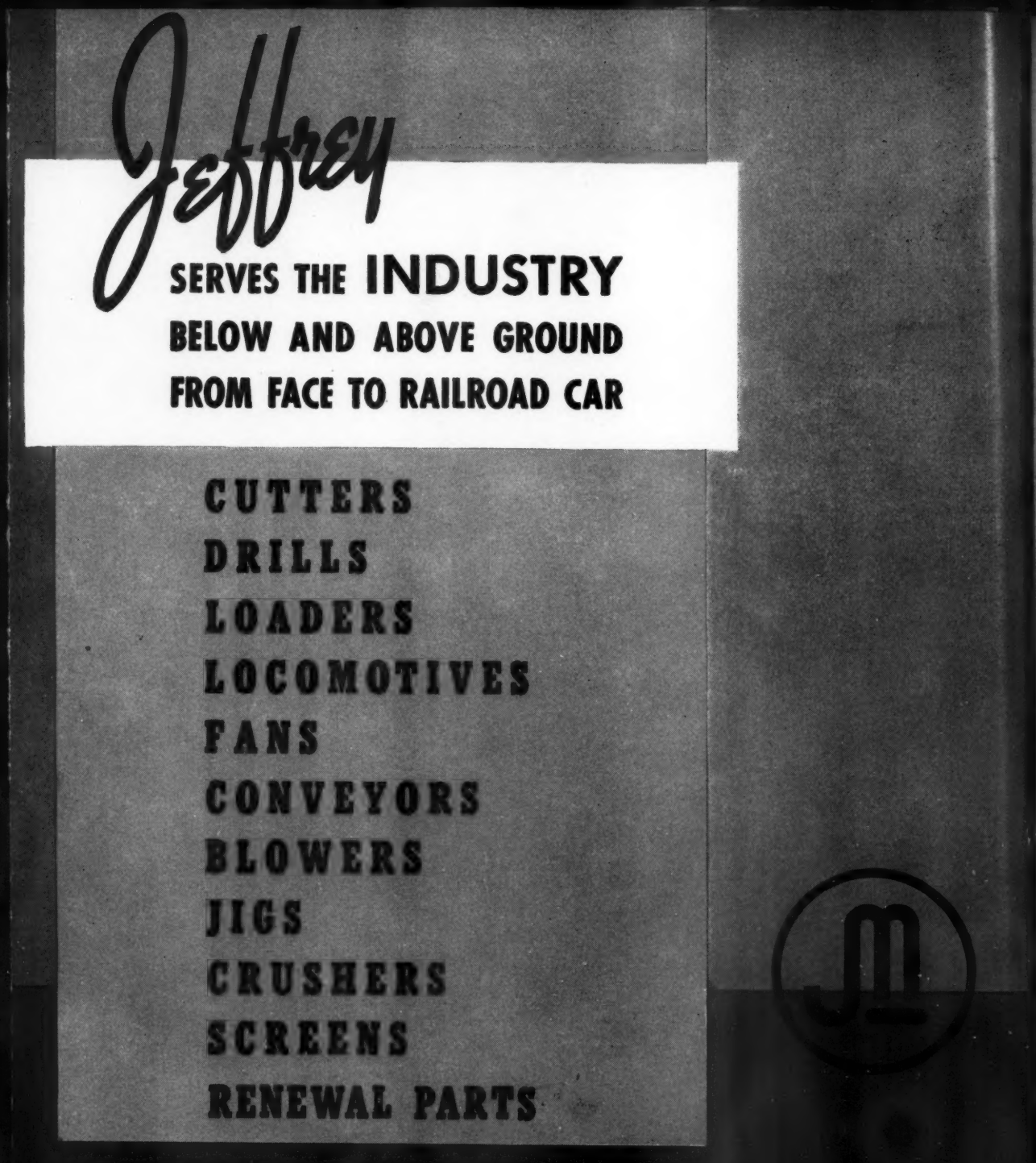
CONVEYORS

Chain and Belt Types

PRESENT-DAY Jeffrey Conveyors are modern and incorporate the following important features essential to successful and profitable conveyor mining:

- Rugged construction
- Durable materials
- Lightweight design to facilitate moving
- Dependable power equipment
- Economical operation and maintenance
- Competent Engineers to assist with the installation and training of workmen

21 types of conveyors from which many combinations can be made to meet the various conditions encountered in mining.



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Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond, Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.

Central States

Ozark Iron Ore Mine

After nearly a year of preparation, ore from historic Iron Mountain, Mo., has gone into the commercial production of pig iron. The mine is located in Iron and St. Francois Counties, and has been rehabilitated by Ozark Ore Company, subsidiary of M. A. Hanna Company, Cleveland, in cooperation with the Defense Plant Corporation. The company has about 20,000 acres of mineral holdings in the mine area.

The ore will be used in the production of pig iron in the blast-furnace plant of Koppers Company, Inc., blast-furnace division, Granite City, Ill. This is also a Defense Plant Corporation project. Koppers recently built a battery of coke ovens to produce the coke which goes into the manufacture of pig iron.

With the development of the mine within 80 miles of the complete blast-furnace plant, there will be available to the steel industry of the St. Louis area a supply of pig iron produced locally and, to a large extent, from local raw materials.

Ozarks Ore's mine annually will produce about 250,000 tons of iron ore, according to reports.

Low-Water Bridge to Save Long Haul

The Carson Mining and Milling Company recently completed a low-water bridge across Spring River, south of the company's tailings retreatment plant on the old Peacock lease, west of Smithfield in Kansas. The company, which has been retreating tailings and slimes from the old Peacock property, is now treating tailings from the old Badger mines on the south side of the river.

The low-water bridge, which has been anchored against being swept away by floods, saves a haulage distance of nearly 8 miles in the truck transportation of the tailings to the mill. Leonard W. Goings, of Joplin, is manager of the company.

Develop an Open-Pit Mine

Fred Childress, of Joplin, manager of the Galena Mining Company, is reported to have begun operations in the development of an open-pit mine on the Southside tract in the northeast part of Galena. A ¾-yd. power shovel and a bulldozer are being used to open a roadway and remove overburden and waste in an old cave a short distance southeast of the company's Bailey shaft.

Initial mine operations will be carried on from an upper level, and ore will be trucked to a railroad ramp, north of the Bailey mine, to be shipped to the Eagle-Picher Central mill in Oklahoma.

Stripping operations were inaugurated in the old Galena mining area a few months ago by the Mess Cave Mining Company, which removed the overburden and is taking out ore from the old bed of Short Creek. The course of the creek was changed by a WPA diversion project a few years ago. The Mess Cave company is operating on the Robesson land, ore being shipped to the Central mill. Eagle-Picher Mining and Smelting Company has also been doing some stripping operations in the Murphy bottoms, a short distance west of the Mess Cave operations.

To Honor Disabled Veterans

The display of special flags designating the number of returned veterans employed by business and manufacturing concerns has been urged by Vivian D. Corbly, of Cincinnati, Ohio, national adjutant of the Disabled American Veterans.

"Business and industry have been flying star-studded service flags showing the number of employes who have gone into the armed forces," Corbly said. "I think that business and industry should be just as proud to fly special flags indicating the number of returned World War II veterans employed.

"This flag should be proudly displayed by industry, with perhaps a special symbol for every disabled veteran that is employed. Certainly these gallant defenders of our nation who have given a part of their well-being should have this special recognition."

The D. A. V. national adjutant said surveys have proved that a disabled worker if properly placed can do as good a job as one who is not handicapped.

Lake Superior Iron Ore Shipments —1944

During the Lake Superior iron ore season of 1944 there was forwarded via vessels, down the Great Lakes, 81,170,538 gross tons of iron ore, according to the official report of the Lake Superior Iron Ore Association. Final cargo was loaded on the steamer *Amasa Stone*, which left Ashland November 28. No ore was shipped in December.

The Duluth, Missabe & Iron Range

A miner reaches for his electric cap lamp as a crew prepares to go underground at the Goodyear mine near Adena, Ohio. Some 700 workers produce in the neighborhood of 4,500 tons of coal daily

Railway shipped 39,663,975 gross tons to its loading docks in Duluth and Two Harbors during the season, as against 40,649,364 gross tons during 1943; 1942 was the peak year for this railroad with 42,780,637 gross tons.

The Great Northern Railway shipped 23,551,664 gross tons from its docks at Allouez during 1944. The combined shipments of the Soo Line and Northern Pacific Railways, serving the Cuyuna Range, amounted to 2,388,287 tons. During the year the Northern Pacific handled 16,411 gross tons of ore from the Steep Rock iron mines in Ontario.

The Chicago & North Western Railway, which takes ore from the Michigan mines, reported 5,778,300 gross tons shipped through the port of Escanaba, Mich. The Duluth, South Shore & Atlantic Railway and the Lake Superior & Ishpeming Railway hauled 3,730,262 gross tons to the port of Marquette, Mich.

Ashland, Wis., which handles Gogebic Range iron ore, shipped a total of 5,578,853 tons. Ore arrives at this point via the North Western and Soo Line Railways. Michipicoten, Ontario, shipped 479,197 gross tons.

Evergreen Sinter Plant Sold

The Evergreen crushing, screening and washing plant, located at Crosby, Minn., has been purchased from Evergreen Mines Company by the Hanna Iron Ore Company, according to a recent report. The Hanna Iron Ore Company had previously purchased one-third of the Cuyuna Range ore reserves of the Evergreen Mining Company. The transaction gives the Hanna company additional reserves and a centralized operation on the Cuyuna Range. Guy B. Hunner is superintendent.

International Mining Day—to be Annual Event

The mining committee of the El Paso Chamber of Commerce has designated the second week of November as the date for International Mining Day of 1945.

The committee also expanded the event to include the petroleum industry as well as the "hard rock" miner.

This action followed the celebration of the first International Mining Day, which was held at El Paso November 10 and 11. About 450 members of the mining fraternity from the International Southwest registered for the event. They came from New Mexico, Texas, Arizona, Colorado and Mexico, with representation from the West Coast, the Mid-West and the East.

With International Mining Day now a fixed annual event on El Paso's calendar, the chamber of commerce is lending its "good offices" to attract two conventions to be held in conjunction with the celebration either in 1945 or 1946. These are the Western Meeting of the American Mining Congress and the Metals Division of the American Institute of Mining and Metallurgical Engineers. All this is part of the chamber's long-range program to expand El Paso into the "mining capital" of the Southwest.

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Your every day recoveries of marketable coal show a sharp increase with SuperDuty Diagonal Deck Coal Washing Tables. Facts and figures kept by hundreds of leading coal mine operators prove SuperDuty's superiority under actual working conditions.

The reason? SuperDuty's exclusive diagonal deck construction combines the operation of a more efficient separation area with low power requirement—substantially 1 H.P. under continuous operation.

These profits are multiplied by the extra years of service built into SuperDuty by 38 years of engineering "Know-How" plus quality material and carefully balanced construction.

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"What's New in Lighting"

The leading lamp and lighting equipment manufacturers of the United States plan to join together April 19 to 23, in the International Lighting Exposition, at the Palmer House in Chicago, to unveil the newest developments in lamps and lighting equipment for industrial plants, schools, offices, stores and similar locations and at the same time show how better lighting is speeding war production and helping to win the war. This will be the largest exhibit of industrial and commercial lighting equipment ever assembled under one roof.

There will be many interesting and informative displays by manufacturers as well as educational exhibits by the Illuminating Engineering Society and by the Better Light Better Sight Bureau which will show the progress made in the utilization of improved light sources for the conservation of eyesight and easier and more comfortable seeing.

As part of the exposition there will be conducted a series of lighting conferences at which outstanding men in the field will discuss the latest trends in lighting practice, the most effective means of providing efficient seeing conditions for school children and for office and factory employes.

The International Lighting Exposition is one of the many activities sponsored by the Industrial and Commercial Lighting Equpiment Section of the National Electrical Manufacturers Association to stimulate better lighting for war production and for the post-war period.

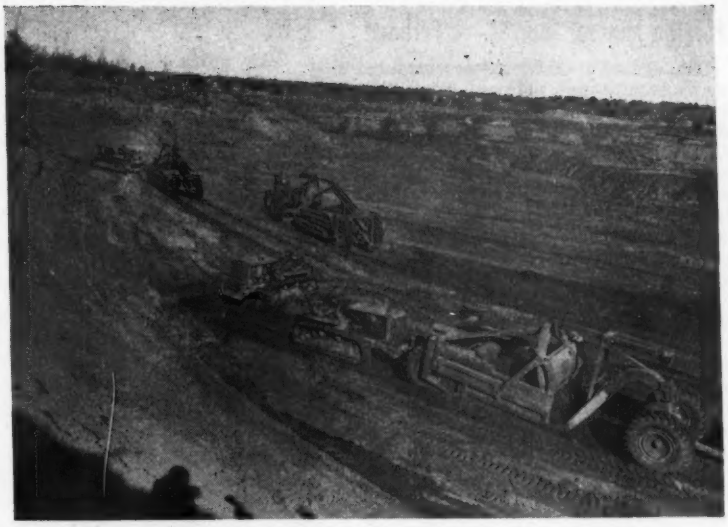
Ohio Coal Land Purchases

The Youghiogheny & Ohio Coal Company is said to have purchased 9,000 acres of coal lands in eastern Ohio. Titles to 226 tracts of coal are being transferred by a deed given by the Cleveland Trust Company to the Youghiogheny & Ohio Company. Stamps on document show $60,000 is involved in the transaction.

The coal is in the Captina Valley area. It is indicated that when the present Y. & O. tracts in northern Belmont and Jefferson counties are exhausted, new acreage will be available for action.

Another transfer involving 4,000 acres is reported. The Van Dyne Realty Company is said to be transferring title to 4,000 acres of coal in the same area to Hyman Finklestein as trustee, thus permitting surrender of the company's charter.

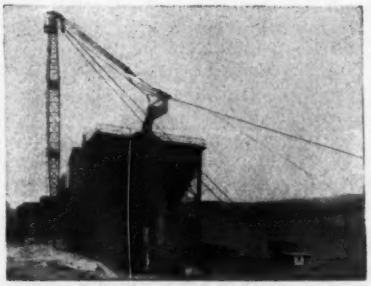
A Southeastern Coal Company deed is said to transfer 39 coal tracts to the Pogue Run Coal Company in Wheeling, Richland and Putney townships.



Zontelli Brothers are removing overburden at the Maroco mine near Crosby, Minn. A fleet of Caterpillar D-8 tractors with LeTourneau scrapers will move 200,000 cu. yds. of sandy material. Average load is 15 yds. with a haul of 600 ft. Each unit makes 8 trips per hour

Costs Reduced

Above picture shows a 6-cu.-yd. Sauerman Scraper operating on a 450-ft. radius handling a 200,000-ton stockpile at a mine.



This Sauerman Slackline Cableway spans a waste pile 1,000 ft. wide and moves culm from pile to hopper on top of briquetting plant.

When You Move Materials the SAUERMAN Way . . .

Strip mining, open pit and stockpiling jobs involving hauls of 100 to 1,000 ft. or more, often are greatly simplified by using a SAUERMAN Power Scraper or Slackline Cableway which digs, conveys and places the materials in one operation.

First cost of a SAUERMAN Machine is reasonable, maintenance expense is small and one man easily handles the operation.

Moreover this equipment is very flexible; is readily adapted to meet any new working conditions or production demands. The range of sizes is large, offering hourly handling capacities from 10 to 600 tons.

Write for Catalog

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Foreign Mineral Sources—a Forecast

The age of unrestricted prospecting by adventurous nationals in the world's mineral areas is coming to an end, Professor Paul F. Kerr, head of the department of geology in Columbia University, said in an address before the Western Connecticut Section of the American Chemical Society at Stamford recently. Mineral resources will be jealously guarded within national frontiers, as proper allocation of essential minerals is inseparable from an enduring peace.

"The barriers which have been erected to keep the nationals of one nation from working on the mineral deposits of another may soon become insurmountable. At one time American engineers and mining industry encircled the earth, opening, developing, and operating mines with a great deal of freedom.

"Today Russia, with its vast domain, is no longer open. The control of Africa is almost exclusively European. South America, even before the war, was becoming intensely nationalistic and there is every reason to believe the trend may be more pronounced after the war. Even in countries where some measure of freedom still exists, restrictions are constantly being added.

"The world in general has been surprisingly well searched for mineral deposits. The important mineral belts are becoming well known not alone to individuals and commercial organizations but particularly to governments. Nations with important mines within their boundaries or within their colonial possessions will be likely to show a most stubborn hesitation to make territorial concessions around the peace table. All of this raises important problems for future consideration.

"The consumption of minerals in wartime is unavoidably wasteful. Reserves for future economical use are drawn upon with abandon. This is necessary, for it has been well said that the country winning the war will have the largest unexpended surplus of war material when peace is declared."

World War II has brought numerous new uses for old minerals, but in addition the common metals of previous wars are in greater demand than ever before, Professor Kerr pointed out.

"The hunger of the Nazi army for gasoline, notwithstanding numerous synthetic installations, must be held largely accountable for the drive across the Ukraine and into the Caucasus," he continued. "It is even likely that the Germans may have considered Baku and the Caspian area a more important military objective than Moscow.

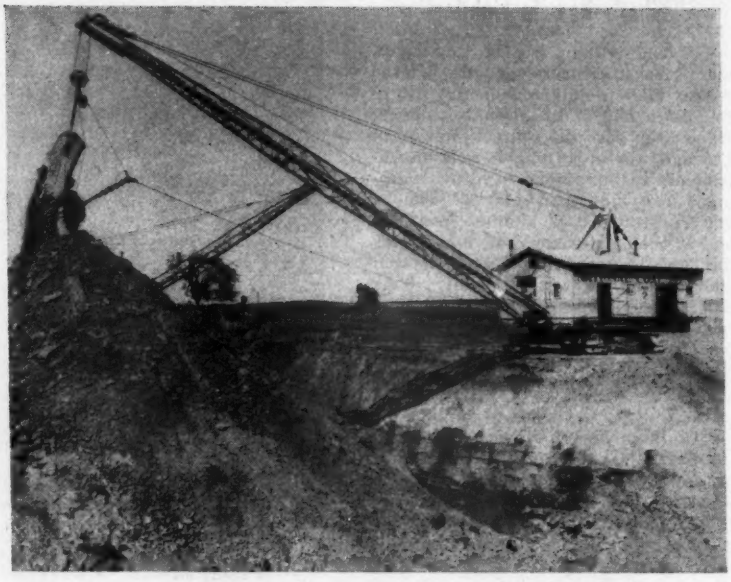
"A number of lessons in the distribution of mineral deposits have been learned by the United States during the war. Before Pearl Harbor our citizens were proud of what was called a self-sufficient mineral economy. We believed ourselves a well-supplied nation and some even felt a little sorry for other nations in the poorly supplied group. The words 'have' and 'have not' were used all too loosely.

"The iron ores of the Lake Superior district, the bauxite of Arkansas, the petroleum of the Mid-continent and the Pacific coast, the molybdenite of Climax, Colo., the coal of the Appalachians, the lead of southeastern Missouri, and other important mineral assets form such an impressive total that we failed to anticipate either the variety or the magnitude of mineral demands. It was only when the hazards of shipping became acute that we realized what was available was not enough and that there were many things we did not have.

"Suddenly mineral requirements reached an all-time high. At the same time our national maritime shipping became subjected to the greatest strain in the history of the nation. We suddenly remembered that many minerals forming an essential part of our economy had been coming from far distant lands. It is needless to debate whether the situation should have been anticipated.

"It is sufficient for the present to feel relieved over the fact that most requirements have been met. It is essential to future planning, however, to remember that the reopening of ocean trade routes has been the most important single factor contributing to the solution of the numerous problems of wartime mineral supply. We have not found new supplies to any such extent as we have found new ships to reach old sources.

"Water transportation must be depended upon to bring tin, cobalt, copper, and manganese from Africa; oil, vanadium, copper, tin, tungsten, quartz crystals, manganese, and iron ore from South America; manganese titanium, and mica from India; and tungsten, nickel, and chrome from the southwest Pacific. These and many lesser mineral commodities have helped to relieve the strain on our domestic mineral economy, but all emphasize the future importance of ocean-borne international trade."



Monighan type dragline, powered by Caterpillar diesel engine, handles 300 yds. of overburden per hour on coal stripping operation near Oskaloosa, Iowa. Machine has 90-ft. boom and 3-yd. bucket

JAN. 14-31

Western States

Mining Meeting in Denver

The Colorado Mining Association will hold its regular annual meeting in Denver, January 25-27. Topics planned for discussion include: Increased mineral exploration and production in the Inter-Mountain area; gold and silver, and the future of sound currency; the tariff problem; mine taxes; new metallurgical developments; etc. The Gold and Silver Banquet will be on January 26 and the annual "Sowbelly Dinner" will be on January 27. Harvey L. Tedrow is convention committee chairman; Oscar H. Johnson is in charge of the Sowbelly Dinner; Ray Summer is Gold and Silver Banquet chairman.

Truck Transport for Idarado Ore

The officials of the Idarado Mining Company and Motorway officials are reported to have made arrangements for trucking smelting grade ore and concentrates from the Black Bear mine and mill at Ouray to Montrose, Colo., there to be loaded directly into broad-gauge cars for shipment. The plan of making one transfer from trucks to broad-gauge cars will eliminate unnecessary transfer and greatly simplify the delivery, with a consequent saving in time and expense. Two or three 20-ton truckloads will be required to fill a broad-gauge car. It is said that the trucks will be on the job as soon as the Idarado mine is ready to make shipments, which should be very soon now. Slow delivery of equipment and supplies, shortage of manpower, and delay in getting machinery from the manufacturers have held up work on the mill but this is now nearing completion.

1,000-Ft. Crosscut Tunnel Being Driven Near Eureka

The Great Divide Mining and Milling Company is reported to have started driving a 1,000-ft. crosscut tunnel near Eureka, Colo. The tunnel is being driven to intersect three veins at new depths. This new tunnel will cut the Empire State vein by driving left of the river and will proceed thence through the old Weherle property to the Tom Moore vein. It is expected that several smaller veins will be cut in this distance. Completion of the new tunnel is expected to take about five months.

At the start, one crew will be employed on the day shift, and if shipping grade ore is struck in the Empire State vein some drifting will be done in an effort to prove at least a small area. Modern equipment has been secured for the operation and a boarding house and bunkhouse are being maintained to facilitate progress in the work in spite of severe weather conditions.

Nevada Mining Situation Reviewed

Jay A. Carpenter, director of the Mackay School of Mines of the University of Nevada, in a statement issued recently, says that Government regulations and acts of Congress during the reconversion period in the immediate post-war years will probably determine the course of the mining industry in the State of Nevada for years to come.

Closing of Government stockpile purchases already has slowed production in some districts, and only return to full-time civilian demand will enable the mines to resume full-time production.

A tour of inspection recently concluded by Mr. Carpenter included the Ely, Pioche, Groom, and Las Vegas mining districts. While in the southern area he inspected the Fontana steel mill, owned and operated by Henry J. Kaiser.

In Ely, Pioche, and Groom districts production is hampered by lack of mine labor, since a sufficient number of capable workers are difficult to obtain in most fields at the present time.

With regard to ore reserves, both Ely and Pioche are assured many years of production in copper and zinc, respectively. For continued production in the post-war years, however, it will be necessary for the Government to maintain premium prices on metals until civilian demand is sufficient to equal present prices.

Production conditions also demand that pre-war tariff rates on imported metals be resumed immediately following the war emergency in order to assure continuation of even the best Nevada base metal mines, in Carpenter's opinion.

At Groom, 85 miles west of Caliente, labor lack has resulted in the production of a restricted tonnage of high-grade lead and silver ore, which is shipped through Caliente to smelters. The mill formerly in use at Groom was forced to close some time ago, due to manpower shortage.

Now operating on a crew of 1,700 men, the BMI plant near Las Vegas, which employed approximately 6,500 men at capacity, is scheduled to close by the end of this month, by order of the War Production Board, due to an excess of metal now available to the Government.

Only the chlorine plant will continue to operate after this month,

(Continued on page 71)

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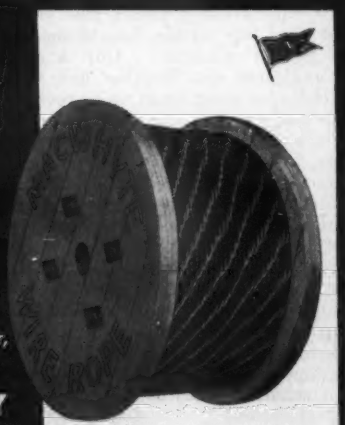

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NO. 725-H

DECLARATION OF POLICY

Northwest Mining Association Golden Anniversary Meeting —December 1-2, 1944

THE Northwest Mining Association, in its fiftieth annual meeting, looks back over half a century of unparalleled progress under the American system of competitive free enterprise, and looks forward to another 50 years which must see the restoration and improvement of this time-honored system after the present emergency.

The mining industry has been called upon to supply in unprecedented amounts the basic minerals vital to victory. We pledge our continued cooperation to the prosecution of the war, recognizing that until the day of ultimate victory few steps can be taken toward a return to normal conditions.

Free Enterprise

Free enterprise, by whatever name it may be called, is the basis of the American way of life. It has brought to America the world's maximum industrial production and highest standard of living.

Free enterprise requires the highest degree of personal freedom attainable under just laws impartially enforced—freedom to save, invest and venture as we wish—absence of arbitrary controls by government—preservation of property rights under a system of government by law and not by men.

Trade Policy

We emphatically reject the viewpoint that our nation has become a have-not in minerals. Our known and indicated ore reserves are substantially as great as at any previous time and improved operating efficiency has compensated for any decline in grade. Nevertheless, we do not resist a moderate increase in mineral imports commensurate with the recent expansion in national industrial capacity, provided that foreign trade policies do not discriminate against domestic mining. We insist that the stability of domestic economy is a fundamental necessity, and that the Government should stockpile any mineral imports in excess of the amounts our national economy can absorb without dislocation.

Premium-Quota Plan

The premium-quota plan was adopted as a wartime measure to obtain necessary production under ceiling prices. However, costs have risen under the premium system to an extent that would jeopardize normal production if premiums were removed and present price ceilings continued. Therefore, we urge retention of the premium-quota system until control of prices is abandoned and until operators who have made investments for war production have had a chance to recover these investments.

Tax Reforms

We favor drastic alteration of Federal tax laws in order to promote development of new mines, and in order to permit operation of existing mines at good rates of production, thus insuring a healthy mining industry and full employment of labor.

We favor a change in the Federal income tax law to permit taxpayers to make reasonable deductions from net income for money expended in grubstakes or primary investments in the development of natural resources.

Venture Capital

We recommend that the Securities and Exchange Commission modify its restrictive rules and regulations so that more venture capital may be made available for all business purposes.

Mineral Land Policies

We support the principle of discovery and location as embodied in the Federal Mining Act, and in the administration of this act we urge that discovery be presumed wherever the claim owner performs in good faith the required location and assessment work, and where his possession of the claim is primarily for mining purposes. We oppose any attempt to bring about the Federal recording of mining claims, and favor the continuation of the present system of recording under state laws.

We oppose the adoption or expansion of a leasing system for mineral resources on public lands, on the ground that it restricts and discourages mineral development.

Indian Reservations

We condemn the creation of Indian reservations except by specific act of Congress, after full congressional hearing in which all interested parties are represented. We advocate repeal of the Wheeler-Howard Act, conferring such authority on the Secretary of the Interior, and reconsideration by Congress of all Indian reservations created in Alaska under that authority.

Reopening of Gold Mines

We recommend that WPB Order L-208, shutting down gold mines, be rescinded immediately, and that—

United States gold producers be permitted to sell newly mined gold in any world market.

Monetary Policy

We favor a currency with a metallic base, using gold and silver. We endorse the continued purchase and coinage of domestic gold and silver, as provided by law, and urge the repeal of the prohibitions on free circulation of gold.

Employe Relationships

We support all efforts to be made by either labor or management that are designed to improve employer-employe relationships. We believe that those relationships can be improved by a limitation of three months on retroactive pay orders imposed by any Federal tribunal.

The foregoing statement representing the well-considered views of the Northwest Mining Association at its fiftieth annual convention, is respectfully called to the attention of members of Congress, and of the national and state administrations, other mining associations and commercial organizations, and those generally interested in the development of the West.

Electric Point Mine

The Electric Point mine and surrounding mineral district near Northport, Wash., in Stevens County, is believed to be one of the freak mineral occurrences of the Northwest. The Electric Point mine was found through an investigation made to determine why lightning hits this particular area during every electrical storm. The investigators discovered high-grade galena ore on the surface and organized the Gladstone Mining Company, shipped ore and paid dividends. Later prospecting revealed other deposits of ore in the district, all of which proved to be a series of chimneys in a more or less regular pattern in a limestone formation. The ore occurred as carbonates and sulphides rich enough to be shipped direct to smelters, some of the shipments running as high as 83 percent lead. The deepest known chimney in the district is reported as bottomed at 750 ft.

NEVADA MINING

(*Continued from page* 69)

with products from this unit to be shipped to southern California war industries.

Judging from present indications, the future of the BMI large plant lies with the State of Nevada or Clark County. If either of these finds it feasible to purchase the electric and water supply systems that have been put into the plant in order to encourage establishment of new working units, utilizing the buildings and facilities already existing, there is a possibility of continuing the plant's usefulness into post-war years.

Plants in Clark County producing silica sand, gypsum and lime products are continuing a steady output. These plants have been in almost continuous operation since about 1910.

With the closing of Government stockpile purchases of zinc ore mined in the Goodsprings district, only a limited tonnage of this ore is being mined and shipped to Midwest smelters.

The Kaiser steel mill at Fontana is running at nearly full capacity. Ore for this production is obtained near the Nevada state line at Kelso, Calif. Kaiser has been drilling another deposit very near the state line, according to Carpenter's report.

The future of the Kaiser plant probably rests with the West Coast market demand. Heretofore it has been cheaper for eastern manufacturers to ship steel to the West Coast than to maintain a manufacturing plant there.

Production Problems are Serious

Moving swiftly to meet New Mexico's share of the national manpower crisis, L. E. Ruffin, State Director of the War Manpower Commission, held a meeting of the Management-Labor Committee for New Mexico at Albuquerque December 20. The conference revealed that there were production lags in 13 essential industries in New Mexico, principally in the metal and coal mines, due to labor shortages. Attending the conference were Fred O. Davis, Potash Company of America; Arthur Ney, Santa Fe Trail Transportation Company; Peter J. Vidal, Gallup retail and wholesale hardware and mine supply merchant; Paul K. Carson, Phelps Dodge Corporation. Labor was represented by Earl J. McDonald, secretary of the New Mexico State Federation of Labor; William T. Wylie, International Carpenters and Joiners Union; and Verne Curtis, CIO international representative.

Heeding an appeal from the WPB and Governor John J. Dempsey, New Mexico mines, mills and smelters, as well as coal mines and lumber mills, observed full work week schedules for Christmas week, except on Christmas Day. There was no cessation of work on New Year's Day.

ARIZONA—State Still Leads in Copper Production; New Deposit Discovered. Keystone Mill Reopens. More Development at Bluebird

A new Arizona copper deposit, recently reported to lie 46 miles northwest of Tucson, in Pinal County, may give up 30,000,000 tons on the basis of preliminary explorations by the U. S. Bureau of Mines. The property, known as the San Manuel mine, is held under purchase option by the Magma Copper Mining Company.

* * *

Reopened to handle custom ores, the old Keystone mill is to serve the Mohave County mining districts of Chloride and Mineral Park. Rehabilitation of the mill was started in early December.

* * *

Sinking of a new shaft to the 100-ft. level and the extension of drifts in the Bluebird copper mine near Inspiration, Gila County, has been announced by the owner, Frank Carrow.

* * *

Arizona's 1943 copper production, recently announced by the Federal Interior Department to total $104,827,000 in value, gave the state its thirty-fourth consecutive year of leadership in the nation for production of the red metal. The state's largest output for a single year, valued at $149,190,600, occurred in 1929.

PAPER Plays a Part in Coal Production Too—

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Montana Mining Group Meets

The sixth biennial legislative meeting of the Mining Association of Montana takes place at the Placer Hotel, in Helena, on January 17, according to John Hickey, president of the organization. Mr. Hickey is president of the Moorlight Mining Company, of Philipsburg.

Carl J. Trauerman, Butte, manager of the Mining Association of Montana and head of the program committee for the forthcoming meeting, states that while details of the program have not yet been completed, there will be two business sessions, one of which will be devoted to the subject of mine safety.

The convention will wind up with the traditional all-Montana stag banquet, at which members of the State Senate and House of Representatives will be personal guests of the members of the Mining Association and business men directly connected with mining and affiliated industries. The banquet, at which there will be only one short speech, is being arranged by the Last Chance Gulch Mining Association, the Helena Chapter of the Mining Association of Montana.

Promising Lead-Silver Vein

The Mineral King Mining Company, operating a prospective property near Saltese, Mont., reports the discovery of a promising vein of lead-silver ore and is said to have been discovered in following directions of a geophysics expert. The Mineral King is a consolidation of the old Tarbox and the Meadow Mountain Mining Companies.

The Boaz Mine

At Norris, Mont., the Boaz gold mine has been closed because of low gold values and increased water on the lower levels. Since starting operations under the ownership of Shirley D. Parker, of Beverly Hills, Calif., and Arthur J. Theis, manager, the mine is said to have produced about $2,000,000 in gold. The mine is equipped with a modern 50-ton cyanide mill, which is to be kept intact pending the development of a parallel gold vein called the "Peanut." Mr. Theis now has charge of a quicksilver property near Darwin, Calif.

Labor Union Financial Reports

District Judge Charles E. Winstead, of Boise, has upheld the constitutionality of Idaho's labor legislation requiring all labor unions to file financial reports with the Secretary of State and banning union activity on farms and feed lots. The law was passed in 1943 by the Twenty-seventh Idaho Legislature.

Highland Surprise—New Control

Owners of the Nevada-Stewart mining property in the Pine Creek district of the Coeur d'Alenes have purchased the controlling interest in the stock of the Highland-Surprise Company, the adjoining property. The Highland-Surprise is equipped with a modern 150-ton milling plant and is operated through two shaft developments on parallel veins. This company paid a dividend this year amounting to 12½ cents a share. The U. S. Bureau of Mines is reported to have diamond-drilled the Nevada-Stewart with favorable results and the company proposes to open its vein system by drifting from the 700-ft. level in the Highland-Surprise shaft, which would give Nevada-Stewart about a 1,500-ft. depth on the ore bodies.

The Highland-Surprise Company reports net earnings of $107,658.45 during the year ended October 31, according to the annual report of the company, after deducting $9,135.45 for depreciation, $28,782.35 for depletion and amortization, and $77,-884.45 for taxes. Income from ore sales totaled $488,123.05 and operating expenses amounted to $303,135.26.

Snows Close Silver Cable

The Silver Cable zinc-lead mine east of Mullan, under lease to the Hecla Mining Company, has closed down for the winter on account of snow conditions at the mine, which is located at a high altitude in the Bitter Root Range. The Hecla Company has been producing about 80 tons of ore per day from this source for the past two years during the operating season, and last year reported a net profit of $46,050.44. Results of the current year's operation have not been reported. Royalties on the ore to the Silver Cable Mining Company have allowed that company to declare a dividend of 1 cent per share.

Copper Mine Resumes Operations

The old Pope-Shenon copper mine at Salmon City, Idaho, which has a past record production of 2,500,000 pounds of copper, has resumed operations under the management of the Grandview Trust Company, represented by Plugloff & Williams, the former a mining man of Hailey and the latter of Boise. The mine is owned by Fred Brough, of Salmon, and Mrs. Laura Ledbetter, of Maxville, Mont. The present operation is on a lifetime-lease basis. At present the leasers are shipping carbonate ore by truck to Mackay, the nearest rail head, and estimate that they have about 50,000 tons of carbonates available. Later it is planned to unwater the mine and erect a milling plant for the treatment of sulphide ores, providing the lower level ore reserves warrant the necessary investment.

Profits from River Beds

Employes of the Golconda custom milling plant, located on the south fork of the Coeur d'Alene River between Wallace and Mullan, have recently leased a section of the river bed from the Golconda Mines Company and have cleaned up the old river channel with a power shovel, obtaining a product that assayed 3½ percent lead, 3½ percent zinc, and 2 ozs. in silver, and produced concentrates averaging 60 percent lead and 30 ozs. in silver for the lead product and 50 percent zinc for the zinc concentrates. The operation covers quite a large area of the river bed above the old Standard Mining Company dam and has produced several carloads of lead and zinc concentrates, illustrating the fact that millions of dollars have gone down the Coeur d'Alene River during the past history of the district. The Hecla Mining Company is milling a deposit of this material at Osburn, west of Wallace, estimated to contain at least 3,000,000 tons. Assay values of this deposit are lower than those quoted above, but Hecla is reported to be making a good profit out of the operation.

Coeur d'Alene Dividends

Ten Coeur d'Alene district mines paid dividends for the year 1944 totaling $4,306,722, as compared with nine mines in 1943 and a record for that year of $4,547,029. The dividend-paying properties this year were Bunker Hill, with $654,000; Clayton, $90,000; Federal, $863,240; Hecla, $1,000,000; Highland-Surprise, $123,-704; Polaris, $600,000; Sherman, $110,250; Silver Dollar, $20,000; Sunshine, $595,528; and Tamarack, $250,000. Bunker Hill, Sunshine and Tamarack reduced their dividends from last year, while Clayton, Federal, Hecla and Sherman paid the same amount as in 1943. Dayrock paid $34,943 last year but none this year. Highland-Surprise and Silver Dollar paid their first dividends this year. The district was short of manpower, which accounts for the dividend shortage.

Buy Bonds Today

Pyrophyllite Deposit Being Developed

A large deposit of pyrophyllite, located in southern Mono County, about 20 miles from Bishop, Calif., is being developed by Huntley Mines, of Big Pine, Calif. The deposit is easily accessible for open-cut mining operations and is reported to contain approximately 1,000,000 tons. The work being done at present consists of constructing an access road, a camp site, and loading bins and platforms. The company is expected to erect the mill at Big Pine both for handling the ore from the new operation as well as the high-grade talc from its White Eagle talc mine in Saline Valley. The development has now been under way for several weeks.

Alkali Plant Acquired

The Columbia Chemical Division of the Pittsburgh Plate Glass Company, in anticipation of greatly increased industrial activity on the Pacific Coast, has acquired the plant and sales organization of the Pacific Alkali Company, according to E. T. Asplundh, vice president.

The Alkali Company has a plant at Bartlett, Calif., 220 miles north of Los Angeles, where it has been making soda ash, borax, and sesqui carbonate of soda, which includes a group of household and industrial cleansing agents. The site of the plant is said to be on one of the richest alkali deposits in this country.

Wheels of Government

(*Continued from page* 57)

Incentive Pay Under Wage-Hour

An answer, in part at least, to a question troubling some mine operators with regard to incentive pay systems in use at their properties, was given in a Supreme Court ruling of January 2 which places pieceworkers, as well as employes paid by the hour or by other methods, under the Fair Labor Standards Act. In reversing a decision of the California Southern District Federal Court, Associate Justice Frank Murphy's majority opinion stated "Neither the policy of the act nor the legislative history gives any real basis for excluding piece workers from the benefits of the statute. . . . A worker is as much an employe when paid by the piece as he is when paid by the hour. The time or mode of compensation, in other words, does not control the determination of whether one is an employe within the meaning of the act and no court is justified in reading in an exception based upon such a factor."

Regulations of the Wage-Hour Division require that where overtime above 40 hours a week is worked, the "total weekly piecework earnings (including production bonuses, if any)," must be divided by the number of hours worked to arrive at the "regularly hourly rate of pay;" and that the "pieceworker" is entitled to be paid a sum, in addition to his weekly piecework earnings, equal to one-half such "regular hourly rate of pay" multiplied by the number of hours worked in excess of 40.

Quasi-Contract Claims

In issuing its Contract Settlement Regulation No. 1, the Reconstruction Finance Corporation has set forth instructions for the filing of claims under Section 17 of the War Contract Termination Act which concerns "defective, informal and quasi contracts," applicable to cases where war materials, services or facilities have been furnished without a formal contract. Detailed instructions are contained in the Regulation, with particular stress laid on the preparation and writing of clear statements of facts concerning any claims, and identifying the Government officer or agent with whom negotiations were conducted.

Up to the present time no claims are known to have been filed with Metals Reserve Company, but the subject matter of Section 17 brings to mind the procedure under the War Minerals Relief Act which became law following the close of World War I.

BOOK REVIEW

THE CONTROL OF GERMANY AND JAPAN

By Harold G. Moulton and Louis Marlio, The Brookings Institution, Washington, D. C.

Dr. Moulton, president of Brookings, and Mr. Marlio, a French economist, engineer and industrialist, together offer a comprehensive and detailed answer to the German problem. They have made a sharp distinction between a wise and feasible course in determining the fate of Germany and Japan and what we might like to do in the matter.

They wisely reject partition of Germany into several states and point out that it would mean an impoverished Germany and in turn an impoverished Europe, thus leading to renewed conflicts.

The authors further reject the turning of Germany into a nation of farmers, noting that it could support only half its present population. "The reduction of any highly industrialized country to an agricultural status would disorganize and contract international trade at a time when an expanding world economy is of paramount importance for all nations."

In the matter of controlling Germany through the rationing of minerals necessary for war, the authors have noted a long list of minerals in which Germany is deficient. As a beginning they note particularly the difficulties of avoiding either an underestimate or an overestimate of Germany's mineral requirements.

Secondly, they note the advancing rate of finding substitutes—a field in which the Germans have shown themselves especially clever. They further note the ease with which smuggling could be carried on and also point out that it would be generally impossible to induce all of the countries in the world to act in unison against Germany, especially if their own markets were improved thereby.

Believing that certain German industries can be wholly suppressed, with strong benefits to the world and without disastrous effects on Germany, the authors recommend a ban on manufacture of aluminum ingots, synthetic petroleum and aircraft, as well as the complete suppression of all German aviation and elimination of a large part of the German electric power industry. The authors are emphatic in their belief that it is a fallacy to think that Germany's preparation for war can be satisfactorily checked by merely economic means. "Economic control measures are two-edged. They are not only of dubious reliability but they are also disturbing to world economic stability. And, in any case, they cannot be enforced unless backed by adequate military power. We are forced to the conclusion that only military force can be relied upon to give protection against nations bent upon aggression."

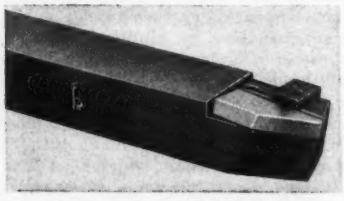
The writers would disarm Germany with complete and utter thoroughness. With the German military machine out of the way, they would refrain from any permanent military occupation, as this would entail a huge and costly military control system, and become a perpetual source of friction involving a continuous series of social and political upheavals.

Ultimately they recommend a Rearmament Detection and Prevention Board of not over five persons. Its duty would be to check German moves toward rearmament and warn the German Government to desist; and in case of failure of the Germans to comply the Board would compel compliance by using the requisite military force against it. The Board would become a form of international government, with its own police force, and should have but one purpose of existence—the prevention of the rearmament of Germany. The book provides perhaps the strongest and to many minds the most realistic answer yet offered to one of the most urgent of present-day world-wide problems.

MANUFACTURERS FORUM

Introduce "H. D." Clamped-on Tools

Kennametal Inc., of Latrobe, Pa., is now producing a line of "H. D." tools having clamped-in and advanceable Kennametal tips, for heavy-duty machining on steel castings, forgings, and bar stock and cast iron. The H. D. design is said to be made possible by the development of heavy-duty Kennametal tips that, while overhanging the tool shank by about



1/16 in., have ample strength to take heavy feeds and depths of cut.

The special type of Kennametal tip used in the H. D. tool has a clamping shelf along the top of the side opposite to the cutting edge. It is diamond ground on the under side. When dull, the tip is advanced and resharpened. The tip may be reground many times, since it is advanced to the front and side, in the oblique recess, until the major part of it has been utilized. Only the cutting edge is ground, and no steel is removed in the process. The recess in the hardened steel shank is finished plane and true with a Kennametal-tipped fly cutter or a Kennametal end file. The clamp and set screw, positioned to avoid abrading, permit smooth, unimpeded chip flow.

New Blast Hole Drill

A new, high speed, blast hole drill, the HS-15, for underground blast hole or core drilling is announced by the Sullivan Machinery Company of Michigan City, Ind. It is said to be specifically designed for drilling long, small diameter blast holes in stopes or pillar robbing operations. It has a capacity of 500 ft. when used as a core drill or for grout hole drilling.

Reported as incorporating a new method of driving the rods called "In-Line Drive," it is said to provide a simple, rigid, vibrationless drive with fewer working parts to give a compact light-weight, easy-to-handle unit. This drill is powered by a single, rotary (non-vane) type air motor, designed and built by the Sullivan Company. The air motor is designed to overcome all irritating noise without the use of a muffler. It makes use of a specially designed reversible mounting, or two position hinge plate, which allows the housing to always open downward when pulling rods. Stepless throttle control and rotating speeds from 0 to 3,300 rpm. are available. Other design features are adjustable, automatic governor; built-in low speed shift, and feed gears to give many different bit revolutions from 100 to 1,200 rpm. per in. of bit advance. Complete details in Sullivan Bulletin D-32.

Four New Distributors for Marion

The Marion Steam Shovel Company, Marion, Ohio, has added to its list of distributors the following companies:

Tulsa Equipment Company, 317 East Third Street, Tulsa, Okla., representing the State of Oklahoma.

Texas Equipment Company, Houston, Tex., Marion distributor for Southwestern Texas.

Shaw Sales and Service Company, 2027 South Sante Fe Avenue, Los Angeles, Calif., will represent Marion power shovels in Southern California.

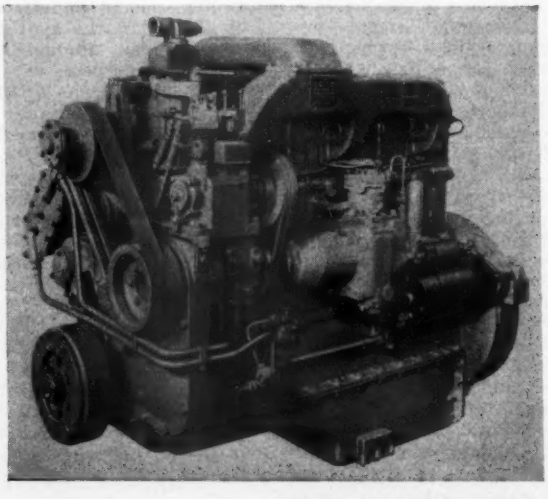
Shaffer & Company, Brazil, Ind., will represent the Marion line in Southern Indiana and Western Kentucky.

Cummins Engine Company's New High Speed Diesels

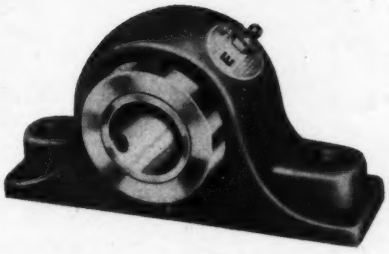
Cummins Engine Company, Inc., of Columbus, Ind., announces the development of a new series of engines, the Series NH-600 and NHS-600 Cummins Dependable Diesels, higher speed and higher horsepower versions of its Model H and its supercharged counterpart, the Model HS. The increased output of these newly developed six-cylinder engines is said to be obtained by these three major innovations in established Cummins design: (1) By increasing the maximum operating speed from 1,800 rpm. to 2,100 rpm. (2) By increasing bore and stroke from 4⅞ x 6″ to 5⅛ x 6″, which increases piston displacement from 672 to 743 cubic inches. (3) Dual intake valves are employed to provide the increased air supply needed to assure efficient combustion of the additional fuel which the engine requires in order to produce increased horsepower. Dual exhaust valves permit the rapid exhausting of gases from the firing chamber.

The improvements are reported to have produced 33⅓ percent additional horsepower without appreciably increasing engine weight or dimensions in the NH model. A gain in horsepower (37½ percent) is revealed by a comparison of the supercharged NHS engine with the supercharged Model HS, with 275 and 200 maximum horsepower output, respectively.

Limited numbers of Series NH and NHS Cummins Diesels have already been placed in service. Most of them have been installed in new 20- and 30-ton dump trucks manufactured by Euclid and Mack, which are working on the Iron Range and on various other open-pit mining jobs both in this country and Canada.



New Pillow Block



The Dodge Manufacturing Corporation of Mishawaka, Ind., announces a new Dodge-Timken Bearing known as Type "E" which is now available in both pillow blocks and flanged units.

It is said to be designed to give 30,000 hours or more of service under conditions for which it is adapted as determined by use of standard selection tables applying to the complete Dodge-Timken line.

The method of fastening to shaft is reported as being simple and effective. On each end of the extended inner race is a steel collar having two headless set screws spaced 120° apart and extending through clearance holes in the inner race to the shaft. These four set screws provide a positive lock to prevent rotation of the inner race on the shaft.

Simple, effective labyrinth seals prevent loss of lubricant and protect bearings against damage from dust, dirt or moisture. These seals are reported to be equally effective whether the bearing is on or off the shaft. The bearings are completely assembled, lubricated and adjusted at the factory. While not fully self-aligning these bearings have enough self-alignment inherent in the design and arrangement of the Timken rollers to compensate for any normal misalignment.

Non-fogging Goggle

Normal breathing has now been harnessed to make a natural ventilating pump for a new goggle which according to reports cannot cloud up or fog, regardless of how much the wearer perspires. Fitted with a bulbous nosepiece, the new fog-free goggle is powered by ordinary lung action. Normal breathing is said to sweep a complete change of fresh air in front of the wearer's eyes about

once every second. This action removes moisture from within the goggle before there is enough of it to condense as fog on the plastic goggle lens, thus providing unblocked vision as well as eye-protection against dust and other flying particles. H. L. Bouton Co., Buzzards Bay, Mass., makes the goggle and Welsh Mfg. Co., Providence, R. I., is sole distributor.

The new goggle was designed by Polaroid Corporation engineers. Inhalation draws air through the intake ports of the goggle. The air then sweeps across the inside of the lens, and passes through an inlet valve into the nose. Exhalation closes the inlet valve and opens the outlet valve in the base of the protruding nosepiece.

ANNOUNCEMENTS

Gould Storage Battery Corporation's S. E. (Syd) Gane, divisional sales manager in the Pittsburgh office for the last seven years, has resigned to form the S. E. Gane & Company, manufacturer's agent for mining industry supplies. He will continue to represent Gould on sales of mine locomotive and shuttle-car batteries in the States of West Virginia, western Pennsylvania, and eastern portions of Ohio and Kentucky.

Mr. Gane will also represent Johnson-March Corporation, manufacturers of dust-control chemicals; Electric Railway Improvement Company, manufacturers of electric bonds; and the Flood City Brass and Electric Company, manufacturers of car-spotting hoists.

* * *

The men and women of A. Leschen & Sons Rope Company, St. Louis, Mo., were awarded the Army-Navy "E" for high achievement in war production on December 8, 1944.

* * *

I-T-E Circuit Breaker Company, Philadelphia, Pa., has opened a district office in the Edmonds Building, 917 Fifteenth Street, N. W., Washington 5, D. C. J. F. Getz is district manager.

CATALOGS AND BULLETINS

ACETYLENE GENERATOR, *Air Reduction Sales Co.*, 60 E. 42nd Street, New York 17, N. Y., has issued a new bulletin on acetylene generators. It features the new Airco type "P" portable generator, incorporating an "air lift" water circulating system and enlarged radiation space between the carbide hopper and water level which eliminate the "hot belt" and provide cooler, double-scrubbed gas.

ARC-WELDING ELECTRODES. *Allis-Chalmers Mfg. Co.*, Milwaukee 1, Wis. Bulletin L-6348 gives complete description of each electrode in the company's line; has separate charts on physical properties of weld metal for each electrode as well as on recommended current values. The electrodes, making up a new company line, are both a.c. and d.c. types and are easily identified by official AWS classification numbers.

RESPIRATORY PROTECTION GUIDE. *E. D. Bullard Co.*, 275 Eighth Street, San Francisco 3, Calif. A new circular, No. 944-970, titled "Guide to Selection of Respiratory Protection" has just been published by E. D. Bullard Company for general distribution to industry. The circular—in chart form—stresses the importance of knowing the exact nature of the exposure, gives over 10 basic types of hazards, and kinds of respiratory equipment necessary for safety.

SPLICING ELECTRIC CABLES. *The B. F. Goodrich Company*, Akron, Ohio. A six-page folder on the Punch-Lok method of banding and splicing electrical applications. Folder describes tools used in Punch-Lok method, lists sizes of preformed and open-end clamps available in Everdur, a copper brass alloy for electrical use, and tells in step-by-step detail how to apply the Punch-Lok bands on many electrical jobs such as connecting, splicing, reinforcing, tieing and repairing lines.

STAINLESS STEEL WELDING ELECTRODES. *Page Steel and Wire Division of American Chain & Cable Company, Inc.*, Monessen, Pa. In addition to suggestions on how to select the proper electrode for welding stainless steel, a new bulletin includes much helpful information on welding procedures and recommendations. It covers carbide precipitation, distortion or warping, effect of heat on the base metal, butt joint design, preparation of joints, and welding dissimilar metals, and has a chart showing recommended electrodes for different types of stainless steel.

It also gives detailed information on the several types of electrodes including application recommendations, physical properties and chemical composition of the weld metal, current range and sizes and packing.

TIRE HANDBOOK. *B. F. Goodrich Co.*, Akron, Ohio. In pocket-size format, the 96 pages of the handbook carry pertinent data on each of the tires which the company makes for commercial service. This data is in condensed, easy-to-read form, and follows the description of the individual tire itself, so that no time need be wasted in looking for the information. A comprehensive index increases reading ease.

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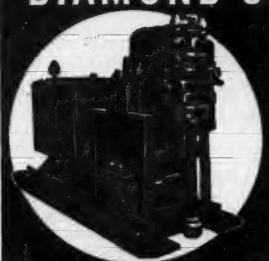
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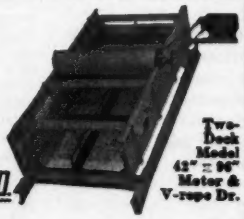
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